

VENTURA
PUBLISHER

Taming RAM Residents • The Best Spell Checkers • LAN Management
Buyers Guide: Spreadsheet Add-Ons • Profile Of Borland's Philippe Kahn

PERSONAL COMPUTING

MARCH 1987 A Hayden Publication

Canada & International \$3.50 U.S.A. \$3.00

HARD
QUESTIONS
AND
NOT-SO-EASY
ANSWERS



0 71486 02040 0

03



Turbo Basic®

Introducing Turbo Basic, the high-speed BASIC you'd expect from Borland!

It's the BASIC compiler you've been waiting for. And it's so fast that you'll never have to wait again.

Turbo Basic is a complete development environment; it includes a lightning-fast compiler, an interactive editor, and a trace debugging system.

Because Turbo Basic is compatible with BASICA, chances are that you already know how to use Turbo Basic.

With Turbo Basic your only speed is "Full Speed Ahead"!

You probably already know us for both Turbo Pascal® and Turbo Prolog.™ Well, we've done it again!

We created Turbo Basic, because BASIC doesn't have to be slow.

In fact, building fast compilers is a Borland specialty; both our Turbo Pascal and our Turbo Prolog outperform all their rivals by factors, and with Turbo Basic, we're proud to introduce the first high-speed BASIC compiler for the IBM® PC. If BASIC taught you how to *walk*, Turbo Basic will teach you how to *run*!

The Critics' Choice

“Borland has succeeded in stretching the language without weighing us down with unnecessary details . . . Turbo Basic is the answer to my wish for a simple yet blindingly fast recreational utility language . . . The one language you can't forget how to use, Turbo Basic is a computer language for the missus, the masters, the masses, and me.

Steve Gibson, InfoWorld

Borland's Turbo Basic has advantages over the Microsoft product, including support of the high-speed 8087 math chip.

John C. Dvorak ♪

Turbo Basic ends the basic confusion

There's now one standard: Turbo Basic.

It's fast, BASICA-compatible, and because Turbo Basic is a Borland product, the price is right, the quality is there, and the power is at your fingertips. You see, Turbo Basic's part of the fast-growing Borland family of programming languages—we call it the "Turbo Family." Hundreds of thousands of users are already using Borland's languages, so you can't go wrong. So join a whole new generation of smart IBM PC users—get your copy of Turbo Basic today. You get an easy-to-read 300+ page manual, two disks, and a free MicroCalc spreadsheet—and an instant start in the fast new world of Turbo Basic. All of this for only \$99.95—Order your copy of Turbo Basic today!

Free spreadsheet included, complete with source code!

Yes, we've included MicroCalc, our sample spreadsheet, complete with source code, so that you can get started right away with a "real program." You can compile and run it "as is," or modify it.

A technical look at Turbo Basic

- ✓ Full recursion supported
- ✓ Standard IEEE floating-point format
- ✓ Floating-point support, with full 8087 (math co-processor) integration. Software emulation if no 8087 present
- ✓ Program size limited only by available memory (no 64K limitation)
- ✓ EGA and CGA support
- ✓ Access to local, static, and global variables
- ✓ Full integration of the compiler, editor, and executable program, with separate windows for editing, messages, tracing, and execution
- ✓ Compile, run-time, and I/O errors place you in the source code where error occurred
- ✓ New long integer (32-bit) data type
- ✓ Full 80-bit precision
- ✓ Pull-down menus
- ✓ Full window management

System requirements

IBM PC, XT, AT and true compatibles, PC-DOS (MS-DOS) 2.0 or later. One floppy drive, 256K.

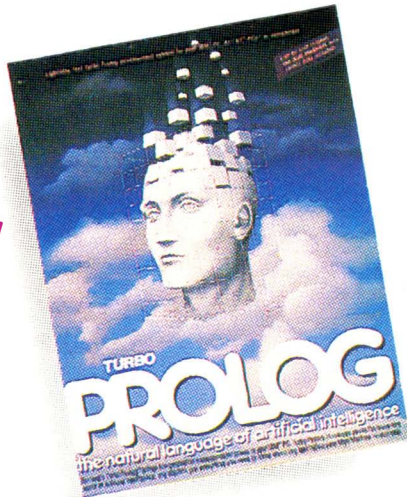
Only \$99.95!



Turbo Prolog™

“ If you're at all interested in artificial intelligence, databases, expert systems, or new ways of thinking about programming, by all means plunk down your \$100 and buy a copy of Turbo Prolog. **Bruce Webster, BYTE** ”

Only \$99.95!



Turbo Prolog, the natural language of Artificial Intelligence, is the most popular AI package in the world with more than 100,000 users. It's the 5th-generation computer programming language that brings supercomputer power to your IBM PC and compatibles. You can join the AI revolution with Turbo Prolog for only \$99.95. Step-by-step tutorials, demo programs and source code included.

New! Turbo Prolog Toolbox

Our new Turbo Prolog Toolbox™ enhances Turbo Prolog—with more than 80 tools and over 8,000 lines of source code that can easily be incorporated into your programs. It includes about 40 example programs that show you how to use and incorporate your new tools.

New Turbo Prolog Toolbox features include:

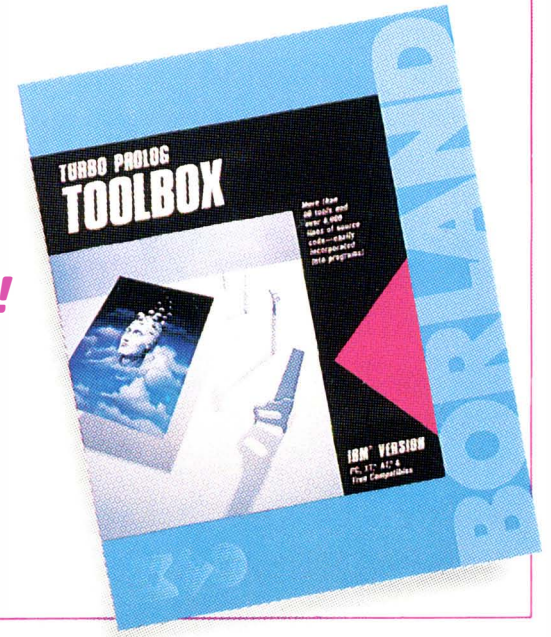
- ✓ Business graphic generation
- ✓ Complete communications package
- ✓ File transfers from Reflex, dBASE III, 1-2-3, Symphony
- ✓ A unique parser generator
- ✓ Sophisticated user-interface design tools

System requirements

Turbo Prolog: IBM PC, XT, AT or true compatibles. PC-DOS (MS-DOS) 2.0 or later. 384K. Turbo Prolog Toolbox requires Turbo Prolog 1.10 or higher. Dual-floppy disk drive or hard disk. 512K.

It's the complete developer's toolbox and a major addition to Turbo Prolog. You get a wide variety of menus—pull-down, pop-up, line, tree and box—so you can choose the one that suits your application best. You'll quickly and easily learn how to produce graphics; set up communications with remote devices; read information from Reflex, dBASE III, Lotus 1-2-3 and Symphony files; generate parsers and design user interfaces. All of this for only \$99.95.

Only \$99.95!



MACINTOSH™
VERSION ALSO
AVAILABLE

Turbo Pascal®

The power and high performance of Turbo Pascal is already in the hands of more than half-a-million people. The technically superior Turbo Pascal is the *de facto* worldwide standard and the clear leader.

The Turbo Pascal family includes:

- Turbo Pascal® 3.0
- Turbo Tutor® 2.0
- Turbo Database Toolbox®
- Turbo Editor Toolbox®
- Turbo Graphix Toolbox®
- Turbo GameWorks®
- Turbo Pascal Numerical Methods Toolbox™

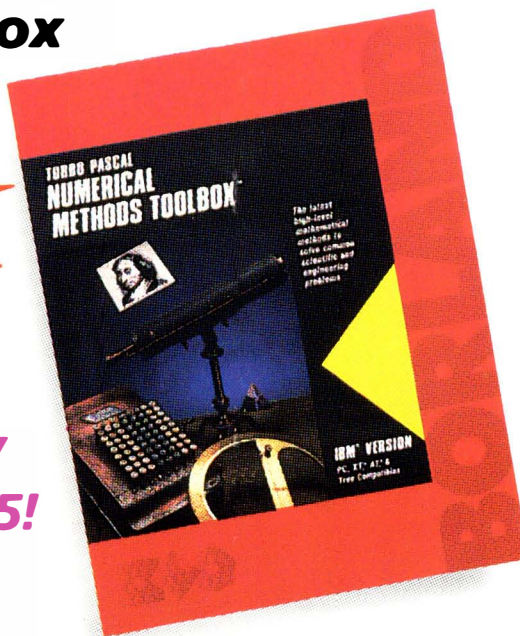


Turbo Pascal, the worldwide standard in high-speed compilers, and family.

“ The language deal of the century. **Jeff Duntemann, PC Magazine** ”

New! Turbo Pascal Numerical Methods Toolbox

Only \$99.95!



As well as a free demo FFT program, you also get Least Squares Fit in 5 different forms:

1. Power
2. Exponential
3. Logarithm
4. 5-term Fourier
5. 5-term Polynomial

They're all ready to compile and run.

All this for only \$99.95!

What our new Numerical Methods Toolbox will do for you now:

- ✓ Find solutions to equations
- ✓ Interpolations
- ✓ Calculus: numerical derivatives and integrals
- ✓ Differential equations
- ✓ Matrix operations: inversions, determinants and eigenvalues
- ✓ Least squares approximations
- ✓ Fourier transforms

System requirements

IBM PC, XT, AT or true compatibles. PC-DOS (MS-DOS) 2.0 or later. Turbo Pascal 2.0 or later. Graphics module requires graphics monitor with IBM CGA, IBM EGA, or Hercules compatible adapter card, and requires Turbo Graphix Toolbox. 8087 or 80287 numeric co-processor not required, but recommended for optimal performance. 256K.

Turbo Pascal 3.0.

Includes 8087 & BCD features for 16-bit MS-DOS and CP/M-86 systems. CP/M-80 version minimum memory: 48K; 8087 and BCD features not available. 128K.



Eureka: The Solver™

Anyone and everyone who routinely works with equations needs Eureka: The Solver

It solves the most complex equations in seconds. Whether you're a scientist, engineer, financial analyst, student, teacher, or some other professional, you need Eureka: The Solver!

Any problem that can be expressed as a linear or non-linear equation can be solved with Eureka. Algebra, Trigonometry and Calculus problems are a snap.

Eureka: The Solver also handles maximization and minimization problems, does plot functions, generates reports, and saves you an incredible amount of time.

$X + \exp(X) = 10$ solved instantly instead of eventually!

Imagine you have to "solve for X," where $X + \exp(X) = 10$, and you don't have Eureka: The Solver. What you do have is a problem, because it's going to take a lot of time guessing at "X." Maybe your guesses get closer and closer to the right answer, but it's also getting closer and closer to midnight and you're doing it the hard way.

With Eureka: The Solver, there's no guessing, no dancing in the dark—you get the right answer, right now. (PS: $X = 2.0705799$, and Eureka solved that one in .4 of a second!)

How to use Eureka: The Solver

It's easy.

1. Enter your equation into the full-screen editor
2. Select the "Solve" command
3. Look at the answer
4. You're done

You can then tell Eureka to

- Evaluate your solution
- Plot a graph
- Generate a report, then send the output to your printer, disk file or screen
- Or all of the above

Eureka: The Solver includes

- ✓ A full-screen editor
- ✓ Pull-down menus
- ✓ Context-sensitive Help
- ✓ On-screen calculator
- ✓ Automatic 8087 math co-processor chip support
- ✓ Powerful financial functions
- ✓ Built-in and user-defined math and financial functions
- ✓ Ability to generate reports complete with plots and lists
- ✓ Polynomial finder
- ✓ Inequality solutions

*Introductory price—good through July 1, 1987

Some of Eureka's key features

You can key in:

- ✓ A formula or formulas
- ✓ A series of equations—and solve for all variables
- ✓ Constraints (like X has to be $<$ or $=$ 2)
- ✓ A function to plot
- ✓ Unit conversions
- ✓ Maximization and minimization problems
- ✓ Interest Rate/Present Value calculations
- ✓ Variables we call "What happens?," like "What happens if I change this variable to 21 and that variable to 27?"

All this power for only \$99.95!

Equation-solving used to be a mainframe problem, but we've solved that problem.

Eureka: The Solver is all you need—and it's yours for only \$99.95!

That kind of savings you can calculate with your fingers!

System requirements

IBM PC, AT, XT, Portable, 3270 or true compatibles.
PC-DOS (MS-DOS) 2.0 and later. 384K.

Only \$99.95!*



4585 SCOTTS VALLEY DRIVE
SCOTTS VALLEY, CA 95066
(408) 438-8400 TELEX 172373

Vive la différence

For the dealer nearest you or to order by phone call

(800)255-8008

in CA (800) 742-1133 in Canada (800) 237-1136

(For More Information Circle 41)





Turbo C[®]

Turbo C: The fastest, most efficient and easy-to-use C compiler at any price

Compilation speed is more than 7000 lines a minute, which makes anything less than Turbo C an exercise in slow motion. Expect what only Borland delivers: Quality, Speed, Power and Price.

Turbo C: The C compiler for amateurs and professionals

If you're just beginning and you've "kinda wanted to learn C," now's your chance to do it the easy way. Like Turbo Pascal, Turbo C's got everything to get you going.

If you're already programming in C, switching to Turbo C will considerably increase your productivity and help make your programs both smaller and faster. Actually, writing in Turbo C is a highly productive and effective method—and we speak from experience. Eureka: The Solver and our new generation of software have been developed using Turbo C.

Turbo C: a complete interactive development environment

Free MicroCalc spreadsheet with source code

Like Turbo Pascal and Turbo Prolog, Turbo C comes with an interactive editor that will show you syntax errors right in your source code. Developing, debugging, and running a Turbo C program is a snap.

Turbo C: The C compiler everybody's been waiting for. Everybody but the competition

Borland's "Quality, Speed, Power and Price" commitment isn't idle corporate chatter. The \$99.95 price tag on Turbo C isn't a "typo," it's real. So if you'd like to learn C in a hurry, pick up the phone. If you're already using C, switch to Turbo C and see the difference for yourself.

System requirements

IBM PC, XT, AT and true compatibles. PC-DOS (MS-DOS) 2.0 or later. One floppy drive. 320K.

Technical Specifications

- ✓ **Compiler:** One-pass compiler generating linkable object modules and inline assembler. Included is Borland's high performance "Turbo Linker." The object module is compatible with the PC-DOS linker. Supports tiny, small, compact, medium, large, and huge memory model libraries. Can mix models with near and far pointers. Includes floating point emulator (utilizes 8087/80287 if installed).
- ✓ **Interactive Editor:** The system includes a powerful, interactive full-screen text editor. If the compiler detects an error, the editor automatically positions the cursor appropriately in the source code.
- ✓ **Development Environment:** A powerful "Make" is included so that managing Turbo C program development is highly efficient. Also includes pull-down menus and windows.
- ✓ **Links with relocatable object modules** created using Borland's Turbo Prolog into a single program.
- ✓ **ANSI C compatible.**
- ✓ **Start-up routine source code included.**
- ✓ **Both command line and integrated environment versions included.**

*Introductory price—good through July 1, 1987

Sieve benchmark (25 iterations)

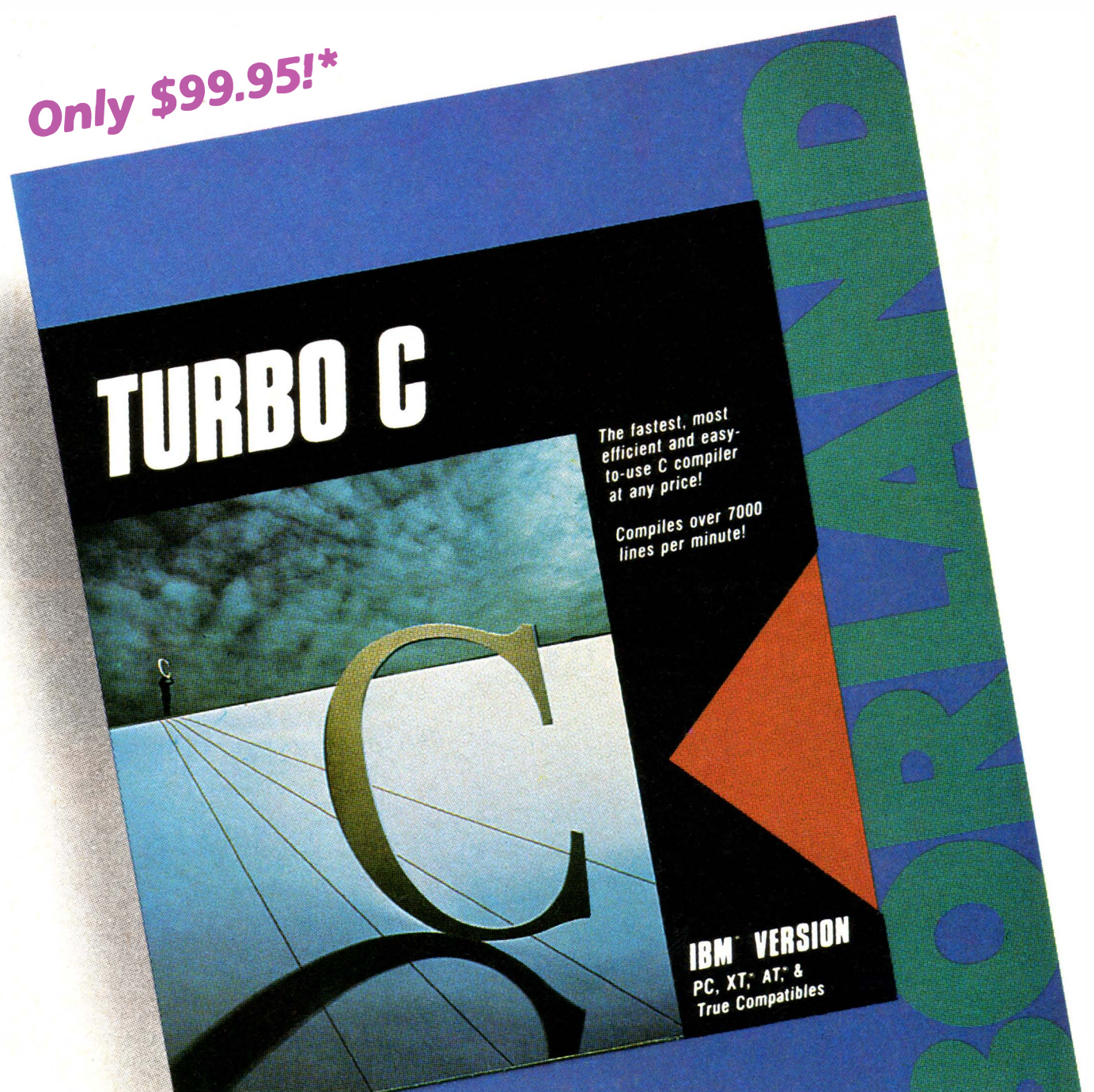
	Turbo C	Microsoft® C	Lattice C
Compile time	3.89	16.37	13.90
Compile and link time	9.94	29.06	27.79
Execution time	5.77	9.51	13.79
Object code size	274	297	301
Price	\$99.95	\$450.00	\$500.00

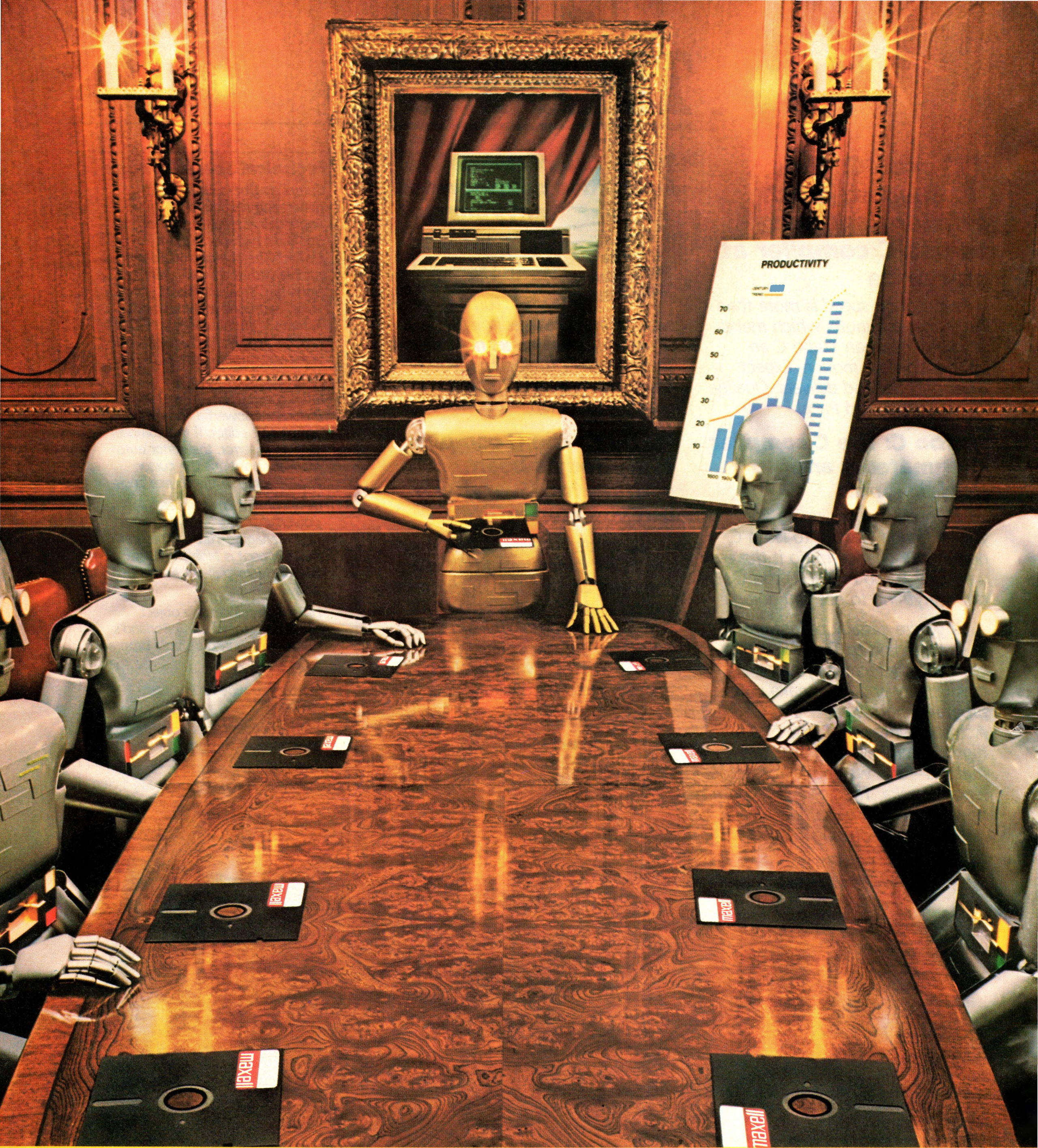
Benchmark run on a 6 Mhz IBM AT using Turbo C version 1.0 and the Turbo Linker version 1.0; Microsoft C version 4.0 and the MS overlay linker version 3.51; Lattice C version 3.1 and the MS object linker version 3.05.

All Borland products are trademarks or registered trademarks of Borland International, Inc. or Borland Analytica, Inc. Other brand and product names are trademarks or registered trademarks of their respective holders. Copyright 1987 Borland International BI-1103

For the dealer nearest you, or to order by phone
call (800) 255-8008
CA (800) 742-1133
Canada (800) 237-1136

Only \$99.95!*





When computers get down to business, they move up to Maxell.

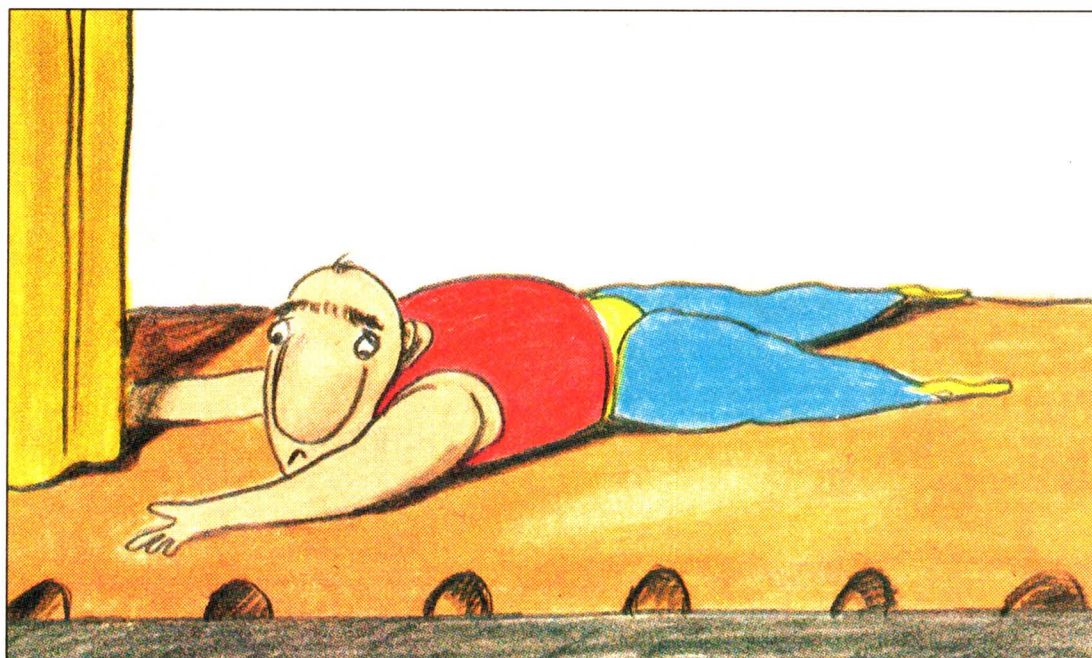
Maxell is ready when you are with the newest technology in magnetic media. A perfect example is this double-sided 3½" microdisk.



maxell
THE GOLD STANDARD

PERSONAL COMPUTING

A HAYDEN PUBLICATION



RAM Residents

Page 81

SPECIAL REPORT

The 386 And DOS 5.0: Hard Questions And Not-So-Easy Answers ..62

Industry experts offer their opinions on the murky issues surrounding Intel's 80386 microprocessor.

Users Who Took The 386 Plunge65, 67, 69, 71

We profile four people who reveal what works for them now.

386 Operating Systems72

There are alternatives to waiting for Microsoft.

Upgrade Plans74

What are companies doing to make sure that they don't get left out?

PRODUCTIVITY

RAM Residents For The Enlightened81

As the standard amount of RAM reaches and passes 640k, a bulging library of often cantankerous RAM-resident programs is tempting users, while concurrently placing unforeseen demands on their systems' overall performance.

PERFORMANCE

How Well Do You Spell?91

The story behind how spelling checkers work, and which ones work best, will help guide you through the thicket of conflicting claims to choose the one program that is right for you.

CORPORATE/BUSINESS

Who Manages The Network?107

There's more to ensuring that a LAN runs smoothly than merely flipping the power switch. The person who manages the network is likely to evolve into one of the most important members of your department.

PROFILE

Philippe Kahn118

The maverick founder and president of Borland International is best known for delivering low-cost, high-quality software. We'll tell you what motivates this software pioneer.

BUYERS GUIDE

Spreadsheet Add-Ons .137

Third-party spreadsheet extras can make working with spreadsheets easier and more productive.

DEPARTMENTS

Editor's Note5

Embarking On Our Future.

Letters13

Product Reviews55

Ventura Publisher, Texas Instruments OmniLaser printer, Tall Tree Systems J Laser Plus-AT board, C.Itoh Prowriter C-715 Reliant printer, Thunder spelling checker, Nissho printer, Zoom/Modem PC 2400XL, Word for Word, Microtek MS-300A image scanner, 101 Macros for Lotus 1-2-3, Kodak Data-show projector, and Inset 2.

Product Index146

Product Listings167

Answers197

Batch files to safeguard hard disk data; PC-to-PC communications; the Tandy 1000 and WordStar 3.31.

Advertiser's Index202

COLUMNS

Update29

Aggressive Lotus Development sues Paperback Software and Mosaic Software, and replaces Spotlight with Metro, a set of desktop accessories; Quarterdeck upgrades Desqview to version 2.0; and Words and Figures bug is fixed.

Industry Watch41

The Software Imitators.

Tips43

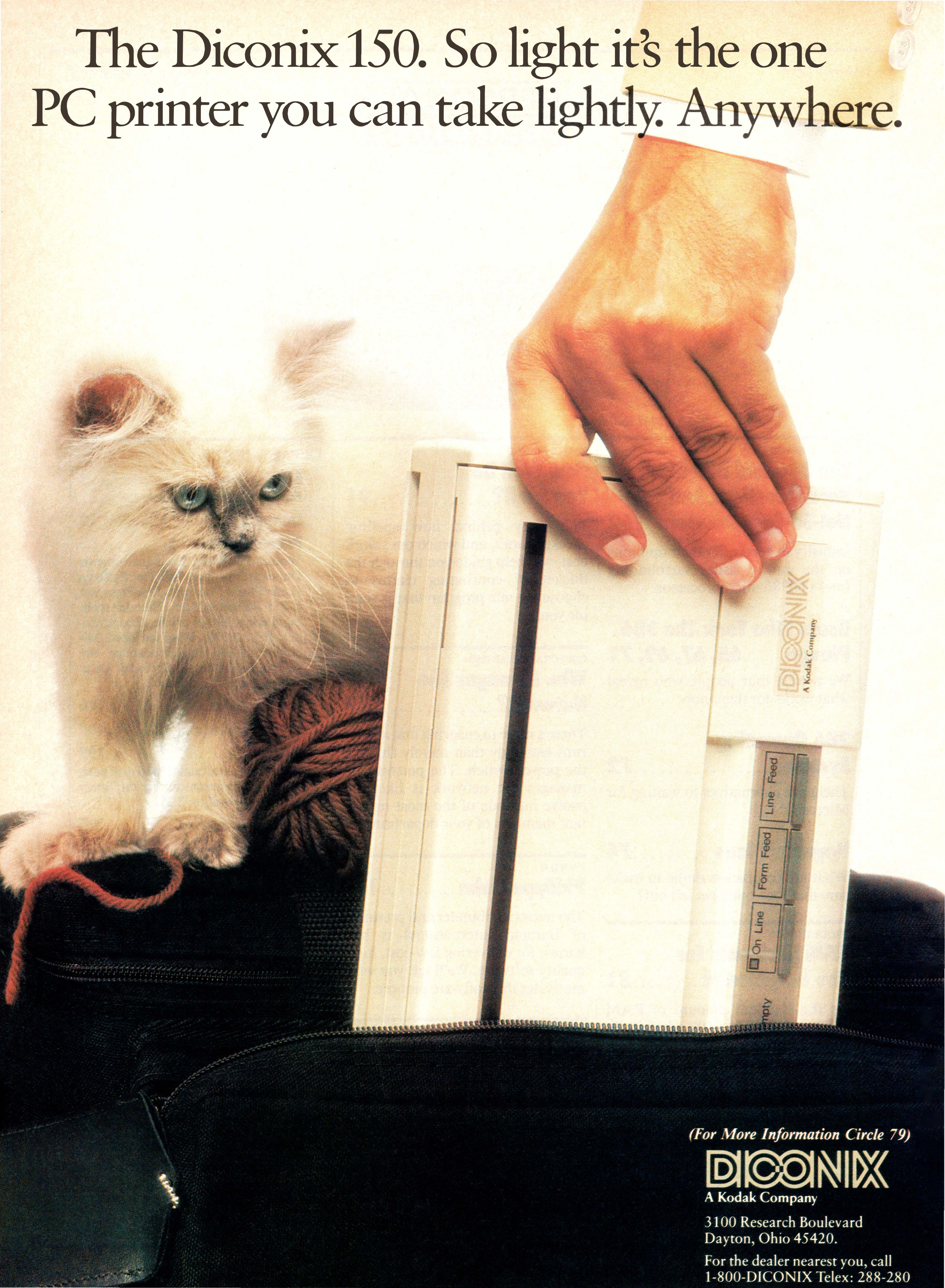
Mastering Printer Drivers.

COVER: Design by Javier Romero.

FOR SUBSCRIBER CHANGE OF ADDRESS AND SUBSCRIPTION INQUIRIES: Call toll-free 800-525-0643. PERSONAL COMPUTING (ISSN 0192-5490) is published monthly by Hayden Publishing Company, Inc., a subsidiary of VNU, 10 Mulholland Drive, Hasbrouck Heights, NJ 07604. Robert J. Lydon, President. Second class postage paid at Hackensack, N.J., and at additional mailing offices. Copyright© 1987, Hayden Publishing Company, Inc., a subsidiary of VNU. All rights reserved. Subscription rates: U.S. 1 year (12 issues) \$18; Canada & Mexico: add \$4/year for surface mail, \$8/year for airmail. Other countries: add \$8/year for surface mail; \$36/year for airmail. Back issues: US: \$4. All other countries: \$5. POSTMASTER: Please send form 3579 to PERSONAL COMPUTING, P.O. Box 2942, Boulder, CO 80322.

648,691 COPIES OF THIS ISSUE PRINTED

The Diconix 150. So light it's the one
PC printer you can take lightly. Anywhere.



(For More Information Circle 79)

DICONIX
A Kodak Company

3100 Research Boulevard
Dayton, Ohio 45420.

For the dealer nearest you, call
1-800-DICONIX Telex: 288-280

EDITOR'S NOTE

Embarking On Our Future

When I consider the developments we are all anticipating in the personal computing field this year, I can't help but recall the foreboding words of Bette Davis in the movie "All About Eve": "Fasten your seat belts, it's going to be a bumpy night." When you recognize that, at this writing, second-guessing IBM is virtually a national pastime among personal computer users and makers, rampant cloning is forcing prices to all-time lows (a 20Mb XT-class compatible with monitor was advertised recently in New York for under \$1,000), the Macintosh has been born again, and local area networks, mainframe links, and other "connectivity" schemes are actually viable enough to link heretofore disparate worlds of computing, then you, too, might be inclined to see the appropriateness of Davis' words.

To my mind, no areas in personal computing demonstrate more potential and peril than the coming 80386 generation of computers and the introduction of a new operating system from Microsoft (whatever-DOS—pick your own moniker). These are bold steps that will steadily advance and affect the marketplace in the coming months. Yet until now, the issues surrounding this new technology have been characterized as a confusing set of tough questions without readily apparent answers. To these questions and answers we have applied our energies in this month's Special Report. By no means do we pretend to have wrought a definitive picture; one simply doesn't exist. But we think we've anticipated your fears, concerns, and confusion, and we expect that you'll find a reliable accounting of the possibilities in store.

What is really happening here is a burst of energetic technology development that is welcome and applauded after the snail's pace (at least in comparison to earlier years) of progress in the recent past. Change never comes easily, however, and the prospect of it naturally fills one with trepidation. Will you have to revamp systems you spent long hours and energy to build, to tap the new technology? Will you see an incremental or a quantum leap in productivity, performance, or whatever it is you measure the benefits of computing by? The most optimistic answers to these and other questions are distinctly possible. And yet we all know that even on the most direct path to progress, chaos is a momentary reality.

A cautionary note here. Though we may have steeled ourselves for a period of change, shouldn't we seek to do a better job this time around than we did in the past? While the fundamental technology of computing keeps promising to make the process easier, aren't the insulated concerns of competing industry forces working against the implementation of those promises in an orderly fashion? So many in the industry are fond of calling their firms solutions-oriented. Wouldn't it make as much sense—good business sense—to address solutions to the problems of business rather than the problems of computing? If this industry is on the verge of a mature resurgence, as it seems to be, this is one requisite that we'll be looking for as part of the coming generation of 386 computers and advanced operating systems. I, for one, would like to loosen my seat belt a notch or two.



FRED ABATEMARCO, EDITOR-IN-CHIEF



BOB WALLACE **PC-WRITE 2.7**

Author Wallace started his company Quicksoft in 1983. Today, it is one of the most successful shareware software companies around. PC-Write 2.7 is one of the most advanced word processors available as shareware. Major features include:

Mail Merge, Spelling Checker, Proportional spacing, Microspace justify, Index creation and many customizing options.

Try PC-Write and if you decide to use it, register with Quicksoft for the latest version, 360 page manual, two updates and phone support plus a newsletter for one year.

- ☐ **78,627 PC-WRITE VERSION 2.7/4** \$12
- ☐ **5 PC-FILE III Version 4**, an excellent database manager for labels, inventory, and form letters \$6
- ☐ **212,334,621,622 RBBS VERSION 14.1a** Set up a bulletin board for your local area \$24
- ☐ **273 BEST UTILITIES** — A collection of our most powerful and useful utilities \$6
- ☐ **310 QMODEM COMMUNICATIONS** — Send letters or programs to your friends or business constituents \$6
- ☐ **403 COMPUTER TUTOR** — Learn to use your computer, great for new users \$6
- ☐ **405 DESKTEAM** — A memory resident calculator, calendar, printer utility, phone dialer, and other desk organizational tools \$6
- ☐ **457 ARCADE GAMES** Shoot 'em up, Spacewars, Helicopter rescues and more \$6
- ☐ **478 HARD DISK UTILITIES** — Some of the most useful utilities for the hard disk user \$6
- ☐ **608 AUTOMENU** — Create professional menus, without all the hassle \$12
- ☐ **610 PACKDISK** — Optimize disk access time \$12
- ☐ **613 MANAGING MONEY** Many useful programs for making the most of your money \$12
- ☐ **614 NEW YORK ADVENTURE** — You're trapped in a New York Ghetto, can you escape? \$12
- ☐ **90,594 GENEALOGY ON DISPLAY v4.0** Family tree with helpful hints to simplify program use \$12

- ☐ **PC-SIG LIBRARY ON CD ROM** \$195.00
- ☐ **NEW 1987 PC-SIG DIRECTORY** \$ 12.95
- ☐ **1 YEAR PC-SIG MEMBERSHIP** \$ 20.00
(\$36 Foreign) (Includes directory, bimonthly magazine and more.)

SPECIAL
Any 5 Disks plus
1-Year Membership
Only \$39 (Include \$4 shipping & handling)

Most programs have documentation on disk and request a donation from satisfied users. Please add \$4 postage and handling per order (\$10 foreign) — California residents add state sales tax.

#305

Total Enclosed \$_____ by ☐ Check ☐ VISA ☐ MC

Card No. _____

Exp. date _____ Signature _____

Name _____

Address _____

City _____ State _____ Zip _____



To order, call: **800-245-6717**
In CA: **800-222-2996**

For technical questions or local orders: **(408) 730-9291**

1030D East Duane Avenue Sunnyvale, CA 94086

(For More Information Circle 190)

Now There's A Management Tool That Lets You Work More Efficiently... Without Changing The Way You Work. Lotus Metro.

Lotus® Metro™ is a memory-resident program that combines the powerful efficiency of 12 business management tools with the time-saving convenience of macros.

Metro gives you more ways to get your work done. Metro has the same command and menu structures as 1-2-3® or Symphony® so you already know how to use it. And since it's from Lotus, you can count on its high quality and reliability to let you start working more efficiently—and in complete confidence—right away.

In fact, when you consider everything Metro can do, you won't believe its low price—just \$85.

The Most Comprehensive Product Of Its Kind.

Metro lets you handle daily tasks on your PC more quickly and easily than ever before. You'll simplify routine—and complicated—jobs. Handle workflow interruptions more effectively. Organize your day.

In short, you'll become more productive by minimizing the time you waste.

Bring All Your Work Together.

You can customize Metro to your needs by choosing any of the following management tools:

- *Clipboard* lets you easily move data and text between 1-2-3, Symphony or other software products—as well as between the Metro management tools themselves.
- *Appointment book* keeps track of your schedule.
- *Phone book* compiles names, addresses and phone numbers—and can even dial your phone.
- *Calculator* includes memory and financial functions.

- *Notepad* lets you jot down quick ideas and memory-joggers you can retrieve at the touch of a button.
- *Editor* creates business letters and spreadsheet reports, and allows you to view and edit existing files.
- *List manager* orders daily tasks, and effectively segments/tracks “to do” lists.
- *Watch* helps you keep records of time spent on as many as 100 different projects.
- *DOS file manager* executes DOS commands from within applications.
- *Kaleidoscope* specifies colors on your screen, *Configuration* lets you build the product that best fits the way you work, *Special characters* contain a full 256 character IBM extended ASCII table.
- And *Macros* let you turn even your most complicated multi-step tasks into one-step commands.

High Quality... Total Compatibility.

Metro is built to the high quality standards of 1-2-3 and Symphony—so it won't endanger your data. Metro is unprotected, so it's easy to install and easy to use. And it can be easily removed from memory whenever you need more room for your spreadsheet or other functions.

As a member of the Lotus family, Metro is the management program best suited—and designed—to work with other Lotus products. And it comes complete with Lotus' unparalleled commitment to customer service, reliability and support.

© 1987 Lotus Development Corporation. Lotus, 1-2-3 and Symphony are registered trademarks of Lotus Development Corporation. Metro is a trademark of Lotus Development Corporation.

System Requirements:

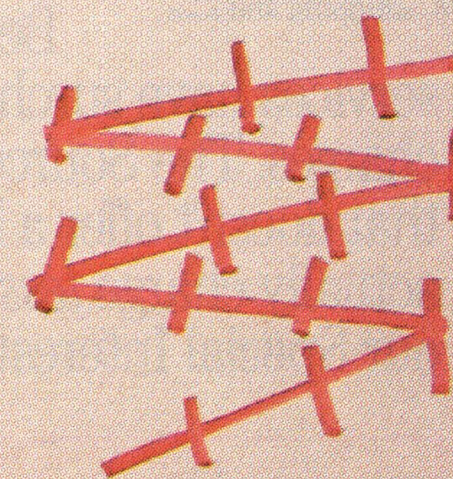
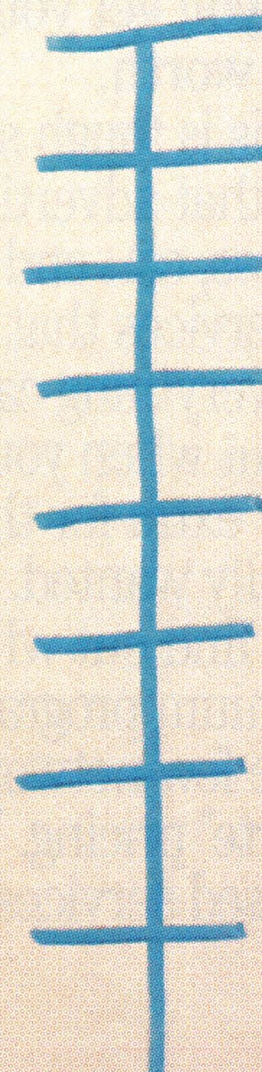
IBM® PC, XT, Portable, AT, COMPAQ® Portable, PLUS, DESKPRO. Two 5.25" double-sided disk drives (hard disk recommended for optimal performance). Minimum of 80K required for RAM-resident portion of Metro. DOS 2.0 or higher. Metro is unprotected and can be removed from memory.

Lotus Metro runs with a wide variety of software programs, including 1-2-3®, Symphony®, Symphony® Spelling Checker, Symphony® Text Outliner, 1-2-3 Report Writer,™ and Signal!™

THE SHORTEST DISTANCE BETWEEN 9 & 5

STUFF
DONE

LOTUS
METRO



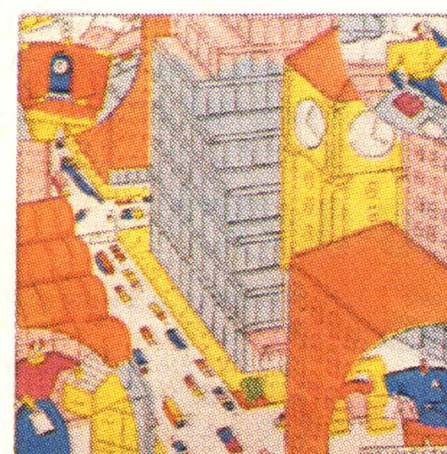
WITH
METRO

WITHOUT
METRO

\$85

Lotus Metro

The memory-resident desktop manager
combining twelve accessories
and a powerful macros program



Try Lotus Metro Today.

No other “desktop” product offers you the power and efficiency of Metro...

The unique combination of comprehensive management tools and macros that allows you to manage your PC... organize your workday...and increase your productivity.

And, at only \$85, no other product even comes close to its value. (Especially since Metro will quickly pay for itself again and again.)

Which is why you should visit your nearest Lotus dealer to sample Metro.

Or, if you're already convinced, simply use the coupon below to order Metro directly from Lotus.

Or order Metro (Product No.GM-1690) by calling Lotus, toll free,

1-800-345-1043

Lotus Metro

*The memory-resident desktop manager
combining twelve accessories and a powerful
macros program.*

Complete and return to: Lotus Development Corporation, 90 Annex, Atlanta, Georgia, 30390-0370 or call 1-800-345-1043.

☐ Yes. I'd like to try Lotus Metro for 30 days without obligation. (GM-1690)

☐ Please send more information about Lotus Metro. (GM-2821)

Send me _____ unit(s) of Metro @ \$85 each _____

Sales Tax ** _____

Total _____

☐ I've enclosed my check or money order made payable to: Lotus Development Corporation.

Please charge my: ☐ VISA ☐ MasterCard

Card No. _____

Expiration Date _____ / _____

Signature _____

Name _____

Company _____

Address _____

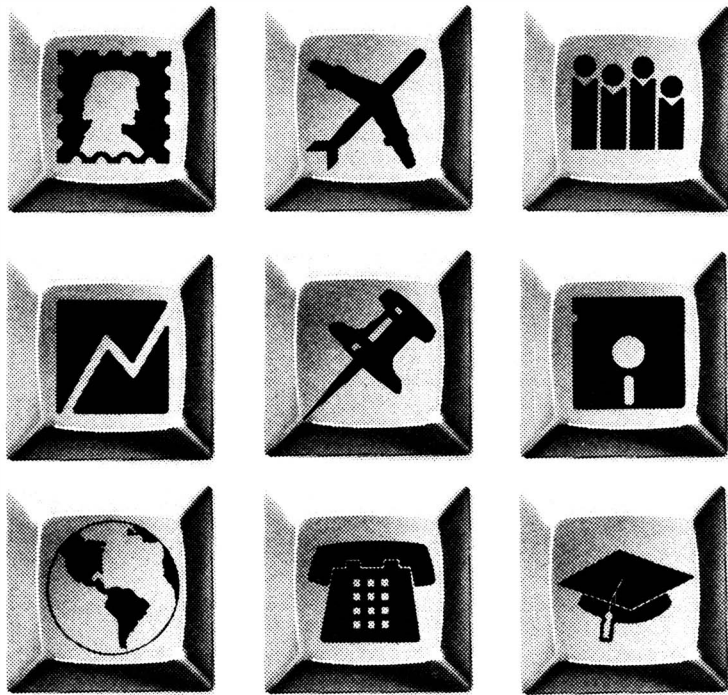
City _____ State _____ Zip _____

Telephone (_____) _____

**Residents of the following states apply applicable sales tax: CA, DE, FL, GA, IL, MA, MD, MI, MN, MO, NJ, NY, OH, TX, VA, WA. Offer good in U.S.A. and Canada only. In Canada make payment by credit card or International Postal Money Order. CODs and purchase orders will not be accepted.

When you purchase Metro directly from Lotus, take your first 30 days to try it out. If, at the end of your first month, Metro does not perform as described and you've purchased it directly from Lotus, we'll gladly give you a full refund.

How to choose an online service



Online services make your PC come alive. But before you settle on one, here are some helpful tips.

1 What are you going to need it for?

Some services cater primarily to investors, while others are trying to be *all* things to *all* people. The Source, on the other hand, offers a carefully developed blend of sophisticated communications tools, easy-to-find information and active Special Interest Groups that can be used for business support, personal enjoyment and household education.

2 What will it cost to learn?

After you find a couple of services that seem to fit your needs, ask about their tutorial offerings. If they don't have any, forget it. Beware of services that offer free connect time without a tutorial. This time gets used up fast and then you're on your own.

The Source has a free, award-winning tutorial that's an easy, step-by-step guided tour of services including business and investing, travel and communications. It gives you all the time you need to learn because there are never online charges for the tutorial.

3 Check out the customer support staff.

Can you get through to them easily? Are they helpful? Do you like them? Ask tough questions about the service and see if they can handle them. Our customer support number is 1-800-336-3330, by the way.

The Source is a carefully developed package of easy-to-use online services including electronic mail, computer-to-computer conferencing, travel services, business and investing information, Special Interest Groups, electronic bulletin boards, news, weather and sports, education, games, shopping and more.

4 Be sure you get your money's worth.

This is tough sometimes. Services that advertise that they cost less, can end up costing more. Services that look like they offer everything can be a disappointment when you join and have to pay extra for the services you really wanted.

Before you join, find out which services have surcharges or premium program charges. The Source is one of the few networks that doesn't offer a lot of "a la carte" pricing. We actually charge *less* for heavily used services like our Special Interest Groups.

**Try The Source® now.
No monthly minimum
fees for six months**

Save up to \$60. This limited-time offer is a great way to find out if The Source is the online service you want. Join The Source now for \$49.95 and we will pay for your first \$10 of usage each month for the first six months. You will be billed for monthly usage charges over \$10.* Your \$49.95 registration fee includes the SourcePak Users Manual, a \$19.95 value. To join The Source today, call 1-800-336-3366** and give the operator this claim number: # HJ233

1-800-336-3366*

The Source®
INFORMATION NETWORK

The Source, P.O. Box 1305, McLean, VA. 22102

*Online rates as low as 10¢ per minute.

**In Canada and Virginia 1-703-821-6666

Offer expires 3/31/87

The Source is a registered service mark of Source Telecomputing Corporation, a subsidiary of The Reader's Digest Association, Inc.
©1987 Source Telecomputing Corporation

PERSONAL COMPUTING

T H E M A G A Z I N E

EDITOR-IN-CHIEF
Fred Abatemarco

EXECUTIVE EDITORS
Peter E. McKie
Sandra R. Reed (West Coast)

ART DIRECTOR
Peter Herbert

MANAGING EDITOR
John Blackford

ASSISTANT MANAGING EDITOR
Michael Antonoff

EDITORIAL PRODUCTION MANAGER
Cecilia Wessner

SENIOR EDITORS
Jack Bell, Amanda C. Hixson

ASSOCIATE EDITORS
Patrick Honan, Cheryl Spencer

CONTRIBUTING EDITORS
Henry Fersko-Weiss, Miriam Liskin,
Richard A. Shaffer

STAFF EDITOR
Bob Sillery

ASSISTANT EDITOR
Stephanie Makrias

EDITORIAL ASSISTANTS
Linda Presto, Suzanne Quigley,
Heather-Jo Taferner

EDITORIAL RESEARCH MANAGER
Melissa Caroselli

ASSISTANT TO THE EDITOR
Gina Bianco

PRODUCTION
Aldo F. Ullio (Director)
Joan Oxner (Assistant Production
Manager)

BUSINESS MANAGER
Richard K. Murphy

CIRCULATION DIRECTOR
Grace A. Surdi

CIRCULATION
Elise Klewin (Promotion Manager)
Annette Guadagnino (Coordinator)
Elaine Rispoli (Assistant)

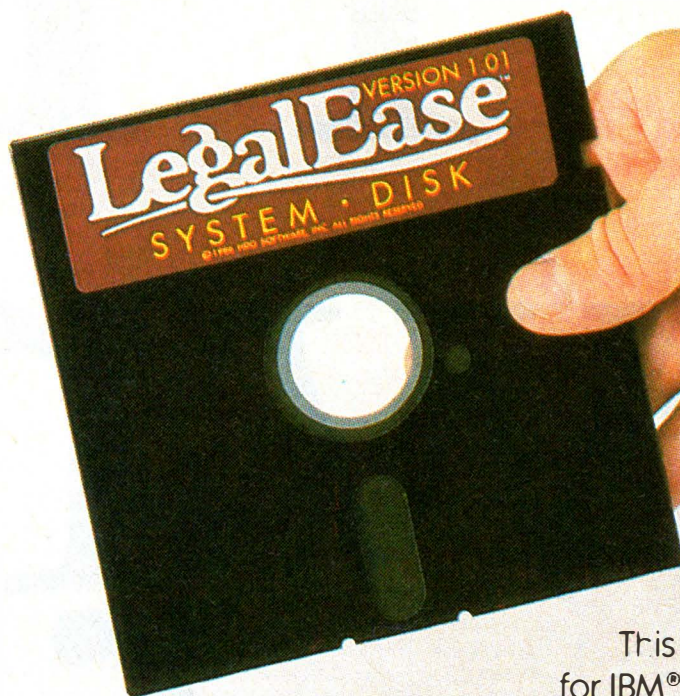
CIRCULATION CONSULTANTS
John D. Klingel, Michael E. Gumbinger

RESEARCH & SALES PROMOTION
Nancy Garafano (Manager)

PUBLISHER Jeff Weiner

"Hayden's Personal Computing magazine's accuracy policy: to make diligent efforts to ensure the accuracy of editorial material. To publish prompt corrections whenever inaccuracies are brought to our attention. Corrections appear in 'Answers.' Address all corrections to The Editors, Personal Computing, 10 Mulholland Dr., Hasbrouck Heights, NJ 07604. To encourage our readers as responsible members of our business community to report to us misleading or fraudulent advertising. To refuse any advertisement deemed to be misleading or fraudulent." Back Issues Of Personal Computing are available on microfilm, microfiche, 16mm or 35mm roll film. They can be ordered from Order Dept., University Microfilms International, 300 North Zeeb Rd., Ann Arbor, MI 48106. Hayden Publishing Co., Inc. Copying without the express permission of Personal Computing is prohibited.

Take the Law Into Your Own Hands.



Save Legal Fees By Using LegalEase.

Now you can use your PC to get the solid protection you need for every business and personal dealing. Instantly! And, because LegalEase™ lets you do it yourself, you save the cost of expensive lawyers. LegalEase pays for itself the first time you use it.

This is a simple, ready-to-use business and legal forms system for IBM® PCs. Its easy-to-read, on-screen menus lead you directly to the right legal document...from a library of more than 150 time-tested LegalEase™ contracts, agreements, leases, notices, waivers, releases and binding business forms. You just retrieve, edit and print using the LegalEase™ menu system and word processor or you may use any standard word processor including WordStar® and MultiMate™. And by ordering your LegalEase™ software right away, you'll get PC WRITE word processing FREE.

LegalEase™ was created by Boston attorney Richard H. Gens especially for smaller and medium-size businesses, and individuals—based on 34 years of drafting and enforcing legal documents. It comes to you complete, with a users manual and a range of such useful legal documents as:

- Promissory Notes (7 versions)
- Notice of Delinquent Account
- Security Agreement (2 versions)
- Power of Attorney (2 versions)
- Short Form of Residential Lease
- Commercial Leases (2 versions)
- Bills of Sale (4 versions)
- Lease of Personal Property
- Offer of Employment
- Employment Agreement
- Employee Non-Compete Agreement
- Notice of Defective Goods
- Contract for Sale of Goods
- Escrow Agreement
- Notice of Shareholders' Meeting
- Notice of Directors' Meeting
- Minutes of Annual Meeting
- General Partnership Agreement
- Real Estate Brokerage Agreement
- Simple Form of Will
- Realty Trust—Nominee

™ The Real Estate Module and The Corporate Module.

The Real Estate Module comes complete with a wide range of Real Estate forms. \$99.95. The Corporate Module contains all the basic legal forms for corporate meetings. \$99.95. Both include a FREE copy of PC Write®!

™ Contains all the legal forms for the

computer industry.

Yes,

please send me: ☐ LegalEase™ at \$129.95. ☐ Real Estate Module at \$99.95. ☐ Corporate Module at \$99.95. ☐ SAVE NOW by ordering any combination of packages and take \$10.00 off each package. POSTAGE AND HANDLING: Single packages add \$7.50. Combination packages add \$10.00. (Mass. residents add 5% sales tax. Outside USA add \$10 per copy.) All packages include your FREE copy of PC Write and have a 30-day money-back guarantee!

☐ Enclosed is my check/money order Charge to my ☐ Visa ☐ MasterCard ☐ American Express

Card No. _____ Expir. Date _____

Signature _____

NO COD'S OR PURCHASE ORDERS. Outside USA make payment by credit card or by bank draft, payable in US dollars drawn on a US bank.

Name _____

Address _____

City _____ State/Zip _____

LegalEase™

PC

HDG Software, Inc. 54 Whitney Street, Sherborn, MA 01770

1-800-628-2828 Ext. 706

For faster service, call us at (617) 651-1881

LegalEase™ is a Trademark of HDG Software, Inc. Copyright 1986, HDG Software, Inc.
LegalEase™ requires an IBM® PC, XT, AT or compatible, DOS 2.0 or higher and 128K RAM.

(For More Information Circle 171)

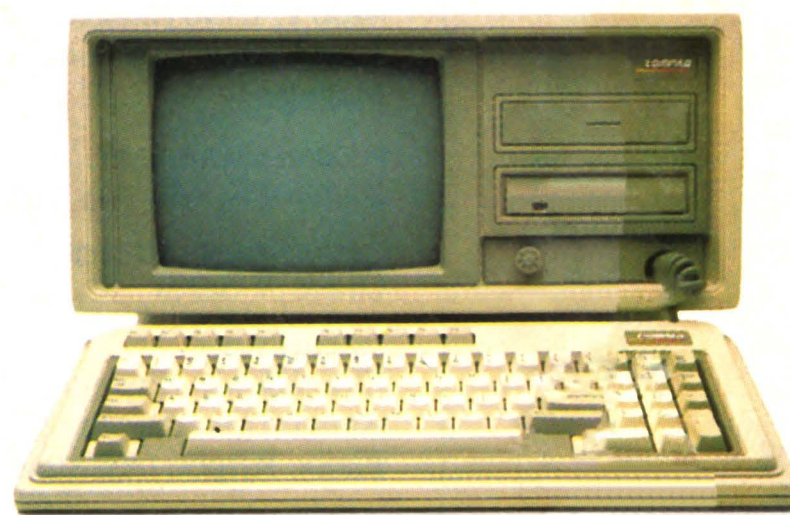
Hardcard 20. Now running with a faster crowd.



IBM XT 286



IBM PC AT



COMPAQ Portable II



COMPAQ Deskpro 286

Our engineers can't seem to leave a good thing alone.

Forget that they created the only 20 MB hard disk drive thin enough for a single slot.

Forget that it's twice as fast as any other. Or that it's twice as rugged and three times more reliable.

Now they want it to keep pace

with a faster crowd. Namely, the 286-based machines pictured above.

Of course, Hardcard™ 20 has always given you AT-like access speed.

But now the Hardcard 20 80286 Upgrade Kit gives you full DOS compatibility in the IBM® PC AT, IBM XT 286, the COMPAQ® Portable II and the COMPAQ Deskpro 286.

you can have your dealer do it for you.

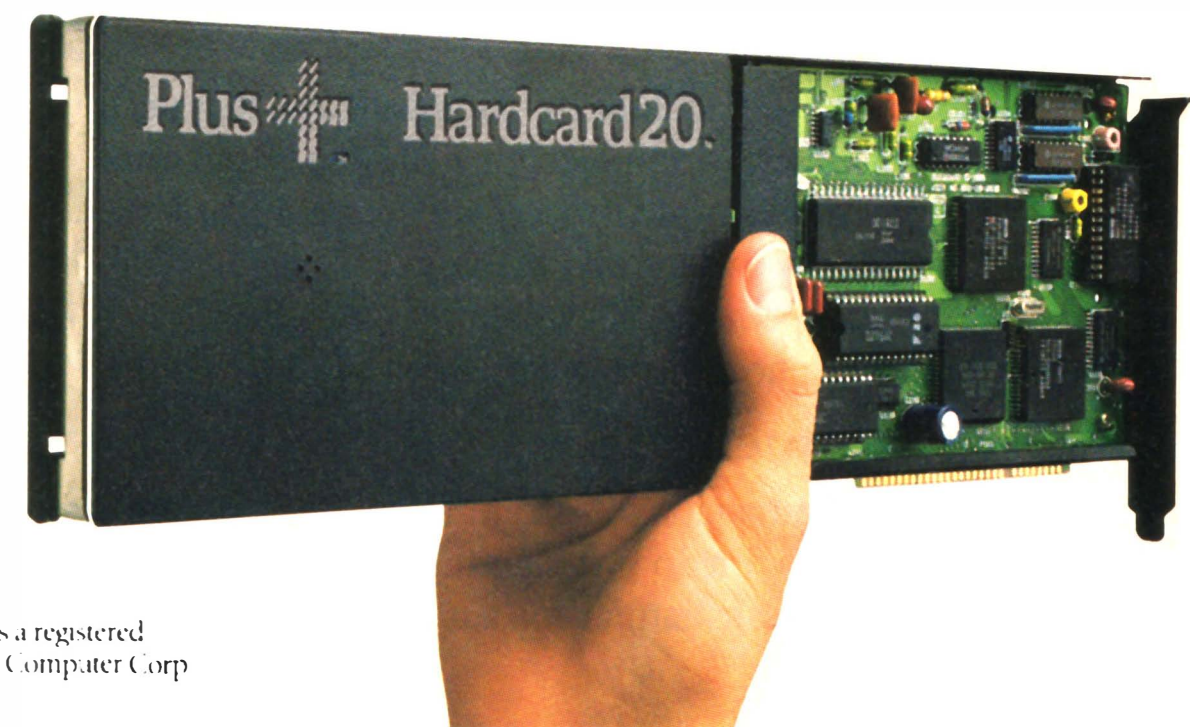
Either way, you'll be ready for a whole new generation of fast machines.

Call (800) 826-8022 for the dealer nearest you. Upgrade Kits are available now.

So hurry in.

And avoid the crowds.

Hardcard™ from Plus™



Extending the useful life of your Hardcard 20.

Buy the Upgrade Kit when you purchase a new Hardcard. Or use it to upgrade a previously installed Hardcard 20.

You can do it yourself because everything you need is provided. Or

© 1987 Plus Development Corp. Plus and Hardcard are trademarks of Plus Development Corp. IBM is a registered trademark of International Business Machines Corp. COMPAQ is a registered trademark of COMPAQ Computer Corp.
(For More Information Circle 86)

NOW Never forget a file name again.



By John Griffith

Surprise! Forget about eight character file names. If you haven't already heard they're soon to be a thing of the past.

Whether you're new to DOS or an advanced user,

with only eight characters it's easy to forget which files are which.

If you're a serious user this is a serious problem so I asked our programmers to fix it!

I wanted a program that was usable from within an application, such as *Lotus 1-2-3™*, *WordPerfect™*, *WordStar™*, etc. But it had to be easy to use; easy for new users and easy for advanced users; and it had to be fast!

Introducing PCEasy™

With PCEasy's 32 character names you can't forget. With meaningful file names like "Letter to Jim Smith 5/9/86" instead of *WordPerfect's* "LTRJSMTH.596" and "Sales Projection Fall Quarter 86" instead of *Lotus 1-2-3's* "SPRJFQ86.WK1" you won't forget either.

To give a file a PCEasy name just pop-up PCEasy's file index, with the cursor bar point to the file you wish to give a PCEasy name, hit the space bar, type in your PCEasy name and press return. It's that easy! Even in the middle of running *1-2-3*, or writing a letter on your word processor, it doesn't matter.

File retrieval is just as quick and easy. From within *1-2-3*, execute the *Lotus™* file retrieve command, then pop-up PCEasy, point to the desired file, press return, and like magic the file is loaded into *1-2-3*. No path names, no funny back slashes, just simple point and run.

What do you do if in the middle of *1-2-3* someone says they need a copy of one of your files, or while saving a file you get an error message that says insufficient disk space? Of course if you leave your program you may lose your work. PCEasy to the rescue! Pop-up PCEasy, select and perform the desired operation from a pull down menu, and continue right from where you left off.

Filing Transformed

PCEasy introduces automatic file organization. You can forget about directories and having to sort your files or look at "trees". Sorting and organization are natural and automatic.

It's easy to learn. If you know *Framework™* you know PCEasy. And it works with memory resident utilities i.e., *Sidekick™*, *Superkey™*, *Reflex™*, *Lightning™*, and *ProKey™*. But PCEasy doesn't stop there. It performs other useful functions such as copying, moving, deleting and inspecting files, the ability to see hidden files, and change file attributes – all without ever having to leave your application program.

Shells and more shells

For the novice user (and some of us that like the convenience) PCEasy includes a complete DOS shell. Now you can set up your applications in their own menu with no batch files required and, best of all, full program and data *pathing* is supported automatically. DOS was never easier.

Why not make your life easy?

PCEasy offers far more features than I can relate to you in a one-page ad without boring you to PC's. So if you would like to make your life easier by expanding your file names, taming DOS and much much more, order your copy of PCEasy today by calling 1-800-423-0772. Florida residents call (305) 276-1500. We will rush you a copy of PCEasy to try risk free for 30 days. If you're not convinced that PCEasy is the best "Forget-Me-Not" you've seen, simply return it and we'll refund your money promptly.

Just \$74.95 plus \$5.00 Shipping and Handling U.S., Foreign add \$15.00. Foreign orders if paid by check must be in U.S. Currency drawn on a U.S. Bank.

To order

TRANSEC™ PCEASY™

NOW: 1-800-423-0772

Visa, MasterCard, and COD's, (sorry no PO's) or send Check or Money Order to:

TranSec Systems, Inc.

220 Congress Park Drive • Suite 200 • Delray Beach, Florida 33445

PCEasy™ runs on IBM® PC's and compatibles using DOS 2.1 or above. A hard disk is required.

Trademarks are the sole property of their respective owners.

LETTERS

INCOME TAX WINDOW

The Lotus 1-2-3 tax worksheet on pages 68-69 of your article, "Tax Strategies for the Age of Reform" (PERFORMANCE, December) is really slick. I, for one, would like to see more such useful tools presented in future issues of *Personal Computing*.

While there were a few formulas missing (I6, some of row H, and the bottom line totals), they were easy enough to supply.

I am not sure, but I believe that the formula in B27 (+B25-B26) is erroneous when one must enter "0" on line 26, because the zero bracket amount on line 26 is greater than line 25. The B27 formula will, then, include the TOTAL ITEMIZED DEDUCTIONS (line 25) in the "Total deductions & exemptions" (line 29). This, of course, results in a lower tax, I think, than is appropriate.

If I am correct, then by removing the formula in B27 and using the following formula in B29 one could handle all the situations for line 26: @IF (B26>0, B25-B26+B28, B28). I would greatly appreciate knowing whether this is correct or not. If not, what needs to be done to handle the "0" when entered on line 26?

Again, thank you for a really useful tax tool.

William Keith Clark, Jr.
Carson City, NV

Editor: The formula in cell B27 is the zero bracket amount, which is the maximum income on which no tax is paid. For a married couple filing jointly for tax year 1986, the zero bracket amount is \$3,670. For cell B26 to be 0, the total of all deductions would be less than \$3,670. If that's the case, the taxpayers should use a short form rather than itemizing. However, we should have subtracted the zero bracket amount from taxable income rather than from deductions, which would result in a higher tax.

In general, our attempt to automate tax calculation created confusion for some readers. Instructions accompanying the Lotus 1-2-3 worksheet said: "Refer to the appropriate line in the worksheet's tax tables [in columns G-H-I for single filers or K-L-M for married filers] and enter the amount computed for your adjusted gross income." Some readers interpreted that to mean that the numbers in columns I and M, which are headed "Your Tax Is," were correct on every line for every income bracket. In fact, the correct tax appears only on the

line appropriate to the taxable income in cell B30. Because all of the formulas reference cell B30, tax calculations for all but the entered income are incorrect.

Our example was the tax return of a married couple with \$24,320 in taxable income in cell B30. In cell M10, the worksheet properly calculates their tax at \$3,249 before credits. The other numbers in column M cannot be used for comparison purposes. A couple with a taxable income of \$70,000, therefore, wouldn't be owed \$612, which is the figure in cell M10 of our example. If \$70,000 were shown in cell B30, the correct tax for that income, \$18,574, would appear in cell M15, which is the line appropriate to the bracket between \$64,750 and \$92,371.

We were overaggressive in using a \$500 political contribution tax credit in the sample worksheet. The maximum tax credit for political contributions is \$100 on a joint return.

Your article on "Tax Strategies" was very enjoyable. I was especially interested in the 1-2-3 spreadsheet for tax calculations. It gave me, as a novice 1-2-3 user, an opportunity to learn more about how 1-2-3 works, and it looked like something that could be used to help with tax planning for myself and acquaintances.

However, I was somewhat disappointed in the article and basic spreadsheet. The formulas should be listed so that a person can key in one and then use the COPY feature to put in the rest that are similar. I had to search through the formulas to determine which were similar, and that slowed the process down considerably. Some of the formulas were left out of the article (column H for 87 and 88) and a few improvements to the basic spreadsheet are necessary, in my opinion. The model assumes a 7.5 percent inflation rate, three (3) dependents, and does not calculate the final tax in line 37. I made changes to those deficiencies in my own spreadsheet. Cells B2, C2, and D2 are where you enter your number of dependents and B29, C29, and D29 calculates the exemptions based on your actual number of dependents. Cell E2 is where I put an assumed inflation rate. Use decimal value of rate (10 percent = 0.1, etc.). The formulas that used the 1.075 multiplier were changed to use (1+E2) as a multiplier. You could refine it further by using another factor for inflation in 1988, but guessing next year's rate is tough enough. Cells B37 to D37

MAC INKER™

MAC INKER™, Automatic Ribbon Re-inker. Re-ink any fabric cartridge or spool for **less than 5 cents**. Over 70,000 in the field and



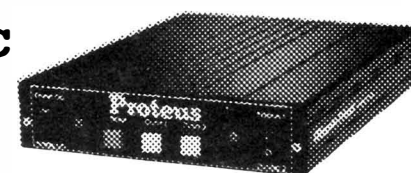
we support **ALL** printers. Universal Cartridge or Universal Spool MAC INKER

\$68.50.

We have cartridges re-inkable in 10 colors. Ask for your printer type or for complete listing. Bottle ink \$3.00/each. Shipping \$3.00.

PROTEUS™, the 'Siamese' Buffer.

It is a **Data Switch** with buffer on both ports. Switch manually or via software. Saves time, space and money. Or ask about our **MAC MASTER** line of Universal Buffers and Printer Controllers (serial or parallel up to 1 MEG).



PROTEUS 64 K-199.00

256 K-299.00 Shipping \$4.00.

Of course we have **Data Switches**, serial/parallel, 2 way, 4 way, crossed etc., at most competitive prices (all lines switched).

CABLES priced \$10-25. We carry cables for all common computers and peripherals. Rapid turn-around on custom orders.

MERCURY MODEM. Really 100% Hayes* Compatible. 300/1200 baud, speaker, full status light display and 2 years warranty. Includes



QUICK LINK, easiest and most reliable Comms Software (available for IBM PC or

Macintosh) **\$149.00** Shipping \$4.00.

*Hayes is a trademark of Hayes Microproducts.

MAC THE RIPPER. Our newest, original and welcome printer companion. Pulls off paper perforations and tears the sheets apart. Takes little space and will pay for itself almost immediately in saved time and tedium. Ask for brochure. Introductory Price **\$299.00**. Shipping \$10.00.

Order Toll Free.

Call or write for free brochure.

1-800-547-3303

In Oregon 503-626-2291 (24 hour line)

We are and always will be your

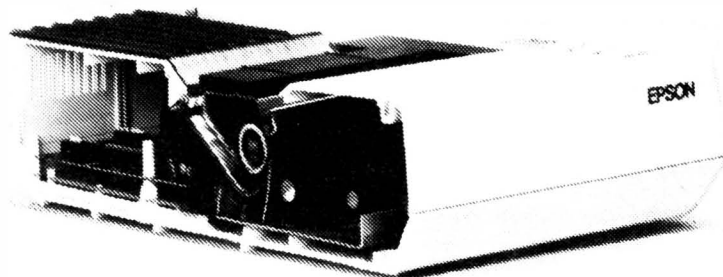
Computer Friends®

14250 N.W. Science Park Drive
Portland, Oregon 97229 Telex 4949559
Dealer inquiries welcome.

(For More Information Circle 163)

Attention all FX80, FX100, JX, RX, & MX owners: You already own half of a great printer

Dealer
inquiries
welcome.



Now
Only
\$79.95

Now for \$79.95 you can own the rest. You see, today's new dot matrix printers offer a lot more.

Like an NLQ mode that makes their letters print almost as sharp as a daisy wheel. And font switching at the touch of a button in over 160 styles. But now, a Dots-Perfect

upgrade kit will make your printer work like the new models in minutes— at a fraction of their cost.

And FX, JX and MX models will print the IBM character set, too.

So, call now and use your Visa, MasterCard, or AmerEx. Don't replace your printer, upgrade it!

1-800-368-7737
In California: 1-800-831-9772

g Sample of
letter with
Dots-Perfect

Dots-Perfect™
Dresselhaus

Sample of
letter without
Dots-Perfect



837 E. Alosta Ave., Glendora, CA 91740 Tel: (818) 914-5831
An upgrade kit for EPSON FX, JX, RX, & MX printers

EPSON is a trademark of
EPSON America, Inc.

(For More Information Circle 154)

DataSaver400[®]
Standby UPS

Power protection for the most powerful microcomputer systems with peripherals is here, now, with the 400 Watt DataSaver. Protect your investment in application software and hardware with reliable, continuous power. 90 and 200 Watt capacities and international models are also available. Dealer, O.E.M. inquiries invited.



Cuesta Systems Corporation
3440 Roberto Court
San Luis Obispo, CA 93401

© 1986, Made in U.S.A.

Write or call 805/541-4160
Telex 4949381 CUESTA

(For More Information Circle 176)

LETTERS

were fixed by adding the formula (+B33 - B36) and so forth.

I believe that 1-2-3 should be able to look at the tax table calculations (column I and M) and pick out the proper tax for line 33. It would need to be told if it was a single or joint return (another information block) and then do the comparison that we must go through now when working the spreadsheet. By adding that operation to the model, it would make the entire operation automatic with the exception of initial data entry. I would like to know how 1-2-3 can be made to do this operation.

Ken Erikson
Norwich, CT

Editor: The worksheet indeed is very basic. Your suggested methods for accounting for inflation and personal exemptions are good additions. Getting 1-2-3 to automatically put the proper tax into line 33 is quite a bit more complicated. One way would be to create look-up tables in a scratch area of the worksheet. You're right that we did inadvertently leave out some formulas, including the three totals on line 37, Your Tax. They should be:

B37: +B33-B36
C37: +C33-C36
D37: +D33-D36.

As for column H (Taxable Income Less Than) in 1987 and 1988, some readers may prefer to enter the numbers rather than formulas. For those who prefer formulas, they are:

H24: +G25+1
H25: +G26+1
H26: +G27+1

H33: +G34+1
H34: +G35+1
H35: +G36+1

VP-EXPERT

The "AI Update" article (PRODUCTIVITY, December) is, generally, excellent. However, on page 105 a small excerpt from an interview that I gave might lead your readers to a very inaccurate understanding of Paperback Software's VP-Expert program. Your quote from me states: "VP-Expert was shown to us as an M.I. clone. We made it a more sophisticated program by adding features like action blocks that tell the program what to do at the end of a rule, but are independent of the rules. This makes it flexible."

While this is an accurate quote, it is only a small part of what I said and it needs clarification. I additionally stated

“Dac-Easy Accounting staged an astounding coup in the accounting category...”

PC WORLD
October 1986

150,000 and more every day. That's how many smart buyers have already chosen to save thousands of dollars in their decision to computerize their books. Recently the readers of PC World confirmed this new trend in accounting software by voting Dac-Easy Accounting as their favorite, outperforming the second place finisher with over five times as many votes.

PC WORLD ★ WORLD CLASS CONTEST ★ ACCOUNTING SOFTWARE ★	
VOTES	PRODUCT/MANUFACTURER
32%	Dac-Easy Accounting, Dac Software, Inc.
6%	Accounting Software, BPI Systems
5%	Easy Business Accounting, Computer Assoc.
4%	Solomon III, TLB Inc.
4%	Accounting Software, Open Systems
4%	Peachtree's Business Accounting System
45%	Others
100%	Total

PERFORMANCE

Accurate information when you need it is what performance is all about. Fast, flexible reports give you what you need to know to manage cash-flow, inventory turns, pricing and profitability. Dac's seven accounting modules work together perfectly. Enter data once and it's posted to the other modules automatically. Most modules can also be used stand-alone.

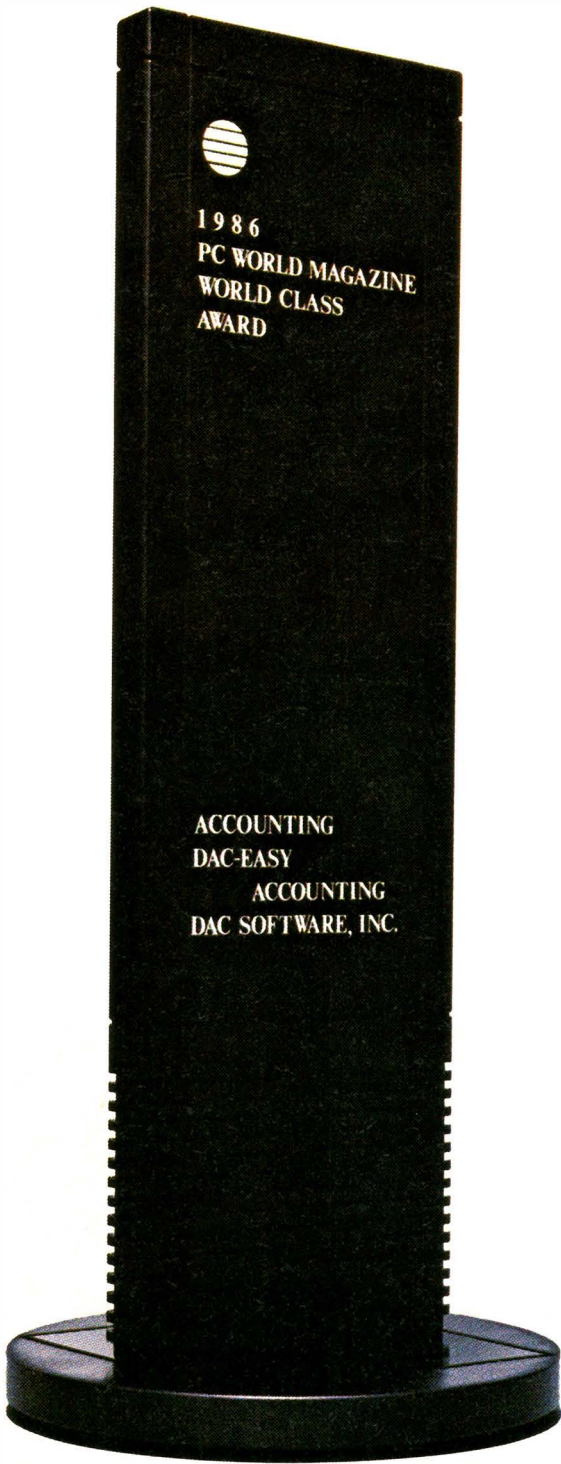
Another measure of performance is versatility. Dac-Easy Accounting can be used by any type of business whether service oriented or product based. It can operate effectively on a floppy system or a hard disk, which gives you the assurance that Dac-Easy Accounting will grow as your business grows.

“Dac-Easy Accounting is everything its designers say it is . . . It is also flexible enough to fulfill the accounting needs of almost any type of business.”

Journal of Financial Accounting, 1985

“I've never before in a review come right out and told readers to buy a product, but I'm doing it now. Dac-Easy is an incredible value.”

PC Week, August 27, 1985



VALUE

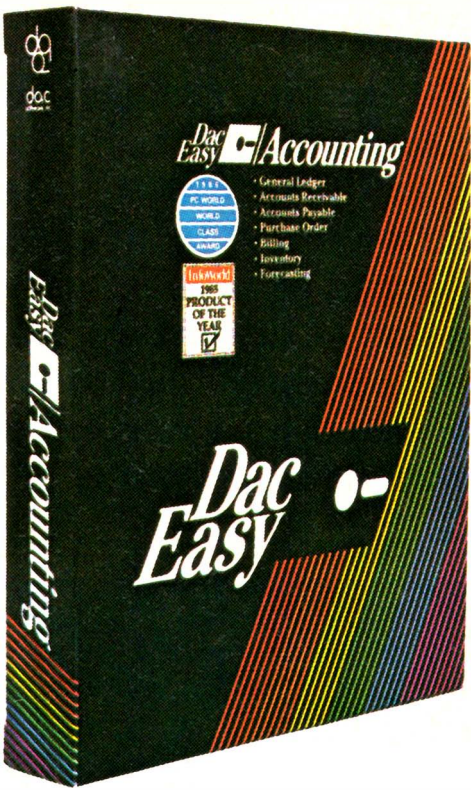
Price plus tremendous performance means value and the Infoworld editors agree, recognizing Dac-Easy Accounting as 1985's "Best Software Value." This is the perfect choice for upgrading from a module by module system or for your first accounting system. Either way compare and join over 150,000 people who have computerized the Dac-Easy way.



NOW FOR ATARI AND APPLE

Dac-Easy Accounting and Payroll are now available for the Atari 520 & 1040 ST. Dac-Easy Accounting is also available for the Apple IIe & IIc.

Minimum Hardware Requirements:
All Dac-Easy Products run on IBM or compatibles, 256K memory, two disk drives, MS-DOS or PC-DOS 2.0 or later, 132-column printer in compressed mode, color or monochrome monitor.
MS-DOS is a trademark of MicroSoft Corp. IBM & PC-DOS 2.0 are registered trademarks of International Business Machines Corp. Pop Up & DeskSet are trademarks of Popular Programs, Inc. Easy Business Accounting is a registered trademark of Computer Associates. Solomon III is a registered trademark of TLB, Inc. Peachtree's Business Accounting System is a registered trademark of Peachtree Software Inc. Dac-Easy is a trademark of Dac Software, Inc.



\$69.95

INCLUDES 7-FULL FEATURED ACCOUNTING MODULES:

- General Ledger
Accounts Receivable
Accounts Payable
Purchase Order
- Billing
Inventory
Forecasting

NEW 1987 DAC-EASY PAYROLL

Dac-Easy Payroll is here just in time for the new tax changes. Dac-Easy Payroll has already become the fastest selling payroll package in the industry, combining payroll management with features such as automatic payroll tax deductions, check printing, W-2 printing, unlimited departmental reports and more. At \$49.95 it is another example of the price/performance value of the Dac-Easy Series.

MONEY SAVING BONUS PACK

Save over 40% when you buy the Dac-Easy Bonus Pack. It includes Dac-Easy Accounting, Payroll, Accounting Tutor, Payroll Tutor, and Pop Up DeskSet Plus, a highly rated desktop utility. This special bundle has a retail value of \$289.75, but is priced at only \$149.95.

TO ORDER
CALL TOLL FREE

1-800-992-7779
(IN TEXAS CALL 1-214-458-0038)

30 DAY MONEY-BACK GUARANTEE

Dac offers 30 day unconditional guarantee on all products bought directly from Dac Software (less shipping charges). There is a \$10 restocking fee if the disk envelope is opened.

Mail to:  **dac software, inc.** 4801 Spring Valley Rd. Bldg. 110-B, Dallas, TX 75244
Yes, please rush me the following Dac products:

Product	Qty.	Price	Total
Dac-Easy Accounting	—	\$69.95	—
Dac-Easy Payroll	—	\$49.95	—
Dac-Easy Word II	—	\$49.95	—
Dac-Easy Base	—	\$49.95	—
Dac-Easy Mate	—	\$39.95	—
Dac-Easy Port	—	\$29.95	—
Dac-Easy Acct. Tutor	—	\$19.95	—
Dac-Easy Pay. Tutor	—	\$19.95	—
Dac-Easy Bonus Pack	—	\$149.95	—
Add Shipping Charge			\$7.50
Texas Residents Add Sales Tax (7¼%)			—
CODE 403		TOTAL	—

Method of Payment
☐ Check ☐ Money Order
☐ MC ☐ AMEX ☐ VISA

Account # _____
Expires _____
Name _____
Company _____
Address _____
City _____
State _____ Zip _____
Phone _____
Computer Brand _____

LETTERS

that VP-Expert has evolved to the point where the product can no longer be considered an M.1 [an expert system development tool from Teknowledge, Inc.] clone. Our position at Paperback Software is that we support market-defined industry standards only to the extent that the standard is worth supporting. We always add a great deal of value to

those standards in the form of new features and capabilities.

For example, VP-Planner includes a spreadsheet that is compatible with Lotus 1-2-3, since the Lotus derivation of the original VisiCalc spreadsheet is both an accepted and a good industry standard worth supporting. Nevertheless, VP-Planner adds a great deal to

that standard in the form of its data base capabilities. It is not simply a 1-2-3 clone, as it has frequently been misrepresented to be. In the case of VP-Info, our relational data base program, we chose to adopt the dBase data base file format as a worthwhile industry standard. However, VP-Info's programming language differs significantly and represents a vast improvement over dBase III.

In the case of VP-Expert, we have completely changed the program from its original appearance for two major reasons. First, too few copies of M.1 have been sold for it to represent any form of an industry standard; and second, upon close analysis we have found M.1 itself to be woefully inadequate in meeting the needs of the general personal computer user. The published quote implies VP-Expert is an M.1 clone with some improvements. In fact, VP-Expert is a radically different program with some historical similarities.

Adam Osborne
CEO, Paperback Software
Berkeley, CA

MORE USEFUL, LESS FLASHY

After reading "Speed! Speed! Speed!" (PRODUCTIVITY, January), all I could think was that there surely must be things that are more important to the vast majority of computer users than ever-bigger RAMs and ever-faster processing rates. While there are probably a number of people who eagerly welcome the advent of the 386 systems, my advice to computer engineers and designers is to concentrate on more useful, if less flashy, advances. Here are three ideas for starts: hard and floppy disk drives that don't crash and damage the files; built-in simultaneous backup systems; and simple "compatibility converters" so that we can break free from the PC/MS-DOS stranglehold and make full use of other, excellent systems.

Steven Tiger
Monroe, NY

A CONSUMER CHOICE

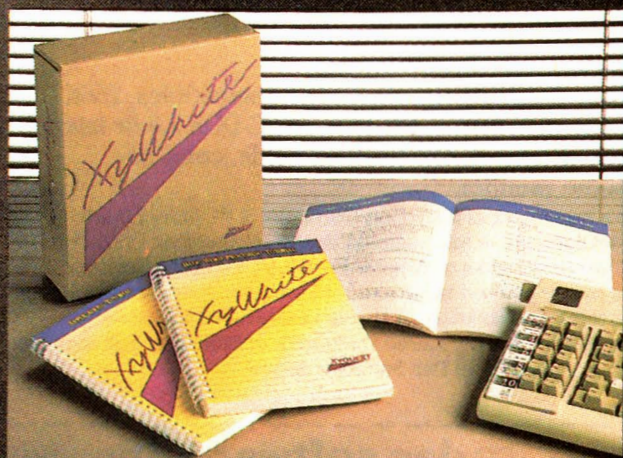
As a recent purchaser of a personal computer and new subscriber to your magazine, I enjoyed reading my first copy. I was a little disappointed, however, with the article "Hard Choices For Consumers" (TIPS, December). Why was there no mention of Tandy computers?

When I decided to purchase a com-

EXTEND YOUR PERFORMANCE

Extend your writing and editing performance with XyWrite III. XyWrite III gives you the flexibility to write everything from a simple memo or letter, to a complex technical or legal document, to a multi-column script. XyWrite III responds instantly to every command to help you stretch your productivity—and your free time.

Extend your imagination and stretch your screen into the ultimate workspace. Touch a key and flip through outline, notes, draft, and daily schedule—up to nine different files in nine windows. Extend your reach: define and redefine every key on your keyboard, or use it as is.



Find out how you can extend your word processing performance with XyWrite III: call (617) 275-4439 and order XyWrite III (\$395), or the demo disk (\$7).

XYQUEST

XyQuest, Inc.
3 Loomis Street, Bedford, MA 01730

(For More Information Circle 179)

No matter where you take CROSSTALK® Mk.4...

You won't encounter a PC communications program with as much versatility as CROSSTALK® Mk. 4. It has everything we could imagine you needing today. More protocols — X-PC, Xmodem, Kermit, and our own CROSSTALK. More terminal emulations, including complete IBM 3101, DEC VT-100, and TeleVideo 900 series. Concurrent communications capability — up to 15 sessions, each displayed in its own expandable window, or on separate "pages." Error checking at high speeds. Prepared script files to extract information from most popular information utilities. A powerful programming language to create customized scripts. Finally, we've built-in a bit of tomorrow. CROSSTALK Mk. 4 is based on a modular architecture that means we can add new capabilities by phone, as they come along. So you're getting more than today's standard in communications software. You're getting tomorrow's as well.

CROSSTALK® Digital Communications Associates, Inc.
COMMUNICATIONS 1000 Holcomb Woods Parkway
Roswell, Georgia 30076
(For More Information Circle 69)

CROSSTALK®
Mk.4

WHY BUY A PRINTER THAT PRINTS ONLY ONE LETTER IN 90 SECONDS,

20th
CENTURY
HOMES

Mr. William Gustaf
Harvest Galleries
100 Main
Stam.

Dear

1
family
designs
combine
date id
If
particu
passive
an attach
but is al
to nature
popular is
Another
feet. The
families w
their livin
have child
interior, th
Siting
Almost every
variety of bu
that rises st
up many inter
example, low c
house. This s
for in-laws or
Again, tha
questions or pr
to call me pers
housing needs.

Very Truly Yours,

Peter O'Connell
Peter O'Connell
National Sales Director

20th
CENTURY
HOMES

Mr. Anthony Bennett
Professional Interiors
3205 Washington St.
Newton, MA 02135

Dear Mr. Bennett:

Thank you for your recent inquiry on the 20th Century family of energy efficient homes. There are now 21 different designs in our portfolio. Most of the plans, you will notice, combine traditional architectural forms with the most up-to-date ideas on technology and comfort.

If one of your goals is low energy costs, you will be particularly interested in several designs that utilize both passive and active solar design. These houses incorporate an attached solarium, which not only serves as a solar furnace, but is also a light-filled space for eating or just being close to nature. These recent designs have proven to be extremely popular in your area.

Another series of designs range from 1400 to 2400 square feet. These plans were especially conceived to suit smaller families who require fewer rooms, yet don't want to cramp their living style. If you are just beginning a family or have children who are grown, you will appreciate the spacious interior, the low maintenance, and projected energy costs.

Siting was another consideration for our architects. Almost every design in this series is adaptable to a wide variety of building sites, from flat to sloping. In fact, land that rises steeply, and is usually considered difficult, opens up many interesting possibilities for most of the designs. For example, low cost extra space can be built under part of the house. This space can even be utilized as a separate apartment for in-laws or an office.

Again, thank you for your interest. If I can answer any questions or provide further information, please don't hesitate to call me personally. We look forward to serving your housing needs.

Very Truly Yours,

Peter O'Connell
Peter O'Connell
National Sales Director

20th
CENTURY
HOMES

November 14, 1986

Mr. James Keefe
Quinn & Johnson, Inc.
855 Tremont Street
Boston, MA 02116

Dear Mr. Keefe:

Thank you for your recent inquiry on the 20th Century family of energy efficient homes. There are now 21 different designs in our portfolio. Most of the plans, you will notice, combine traditional architectural forms with the most up-to-date ideas on technology and comfort.

If one of your goals is low energy costs, you will be particularly interested in several designs that utilize both passive and active solar design. These houses incorporate an attached solarium, which not only serves as a solar furnace, but is also a light-filled space for eating or just being close to nature. These recent designs have proven to be extremely popular in your area.

Another series of designs range from 1400 to 2400 square feet. These plans were especially conceived to suit smaller families who require fewer rooms, yet don't want to cramp their living style. If you are just beginning a family or have children who are grown, you will appreciate the spacious interior, the low maintenance, and projected energy costs.

Siting was another consideration for our architects. Almost every design in this series is adaptable to a wide variety of building sites, from flat to sloping. In fact, land that rises steeply, and is usually considered difficult, opens up many interesting possibilities for most of the designs. For example, low cost extra space can be built under part of the house. This space can even be utilized as a separate apartment for in-laws or an office.

Again, thank you for your interest. If I can answer any questions or provide further information, please don't hesitate to call me personally. We look forward to serving your housing needs.

Very Truly Yours,

Peter O'Connell
Peter O'Connell
National Sales Director

WHEN YOU CAN BUY ONE THAT PRINTS TWO IN THE SAME TIME.

With its advanced 24-pin printhead, our Pinwriter P6 dot matrix printer prints letter-quality characters in a single pass. Conventional 9-pin printers need two passes—and twice as much time—to do the same amount of work.

But the Pinwriter P6 isn't just faster. It's better. Because even after two passes, a 9-pin printer just can't deliver the kind of sharp, dense characters you get with our Pinwriter P6 24-pin printer. Take a look at the print sample

inset above and see for yourself.

So consider the speed. Compare the quality. Then add in the fact that NEC offers you the lowest noise level in the industry and more built-in fonts than anyone—and you'll see why our Pinwriter printers outclass every other printer in their price range.

Which is exactly what people have come to expect from NEC. After all, we're the world's largest manufacturer of 24-pin printers. And we offer more models. Some can even print three or more letters in 90 seconds.

For more information, call 1-800-343-4418 (in MA 617-264-8635). Or write: NEC Information Systems, Dept. 1610, 1414 Massachusetts Ave., Boxborough, MA 01719.

**NEC PRINTERS. THEY ONLY STOP
WHEN YOU WANT THEM TO.**



NEC

NEC Information Systems, Inc.

(For More Information Circle 54)

LETTERS

puter, I read every review and article I could find before selecting the Tandy 1000 SX. My decision was based on its IBM compatibility, documentation, service, price, place in the market, and reputation. I was impressed with the fact that Tandy IBM compatibles are produced in the United States and that Tandy is number one in the sale of PC compatible computers.

There is growing concern about the U.S. trade deficit, and I think Tandy is to be commended for offering such a fine American-made computer at competitive prices.

Dennis Gunderson
Rapid City, SD

Editor: You're right. Tandy is now a significant factor in the personal computing market. They should have been included in the article.

SIMULATIONS SPELL RELIEF

Robin Nelson's article, "Into The Wild Blue Yonder" (ESSAY, November) was terrific. Speaking as one whose personality definitely has been toggled into another mode (not necessarily hyperanal, however) by some of the more abstruse applications, I feel programs like Flight Simulator, Gato, or Strike Eagle should be bundled with every computer.

The day is not far off when Ashton-Tate or Lotus will be sued by an unhappy spouse whose mate disappeared into a spreadsheet and was never heard from again; bundling of a really decent simulation with each system might be as important as knowing where your Pepto-Bismol is after ingesting a Szechuan banquet.

I hope Robin Nelson will essay forth in *Personal Computing's* pages again. (Sorry, I couldn't help that. Perhaps I am in hyperanal mode, after all....)

Marcia Blake
Paradise, CA

WORDPERFECT LIBRARY

A review of WordPerfect Library in your November issue must not go without a response. You state that the product is intended for use with Word Perfect Corporation products only.

Not so! For example, at one office in our community, WordPerfect Library is used as a DOS shell program to provide easy entrance and exit to Lotus 1-2-3, WordPerfect 4.1, dBase III Plus, Aspen/2, Harvard Total Project Manager, a tele-

communications package, and several utilities, in addition to the clock, calendar, calculator, and such included with the program. There have been no problems and I consider the WordPerfect Library to be a wonderful disk management and menu system for any hard disk user. And, as icing on the cake, the package includes a Macro and Program Editor. The program is a very useful piece of software.

Marilu Waybourn
Flora Vista, NM

A LOOK BEFORE YOU BUY

Your article, "Three Alternatives for Managing Your Portfolio" (PERFORMANCE, November) was timely and well written.

I realize the story did not really make a comparison of different software packages, but I would like to make one clarification. Under your "Dedicated Software" section, you state that "With the average portfolio management software package priced in the \$200 to \$300 range, you are required to spend a considerable sum in advance for a software package that you have not even seen demonstrated, and once you open the software package, it can not be returned for a refund."

While this is true of most packages, Market Maker Investment Software offers a \$15 demonstration package that contains complete documentation and a 95 percent complete demo (it limits incremental values, but is otherwise complete) of its AVA (Asset Valuation and Analysis) investment portfolio package. Additionally, the demo price is credited to the purchase of the actual Market Maker Investment package, which has a suggested retail of \$195.

Serge Timacheff
San Francisco, CA

Editor: Serge Timacheff is a partner in the public relations firm that represents Market Maker Investment Software.

NOT SO SMART

The "AI Update" article (PRODUCTIVITY, December) did little to address the state of "legitimate" artificial intelligence. You neglected to reference the gentleman who is considered one of the fathers of AI, Carnegie-Mellon Professor of Psychology and Computer Science and Nobel Prize-winner Herbert Simon. An interview with Dr. Simon and his colleagues, rather than just with

Boost cursor speed. Stop cursor run-on.

With all the recent hoopla over performance, it's ironic that two of the PC's ergonomic deficiencies have been overlooked — its slow cursor, and the tendency of the cursor to remain in motion (run-on) after a cursor key has been released. Finally, the solution — Cruise Control™ from Revolution Software.

Cruise Control is a new productivity tool for serious PC users. It boosts cursor speed, typically by 3-5 X. It eliminates annoying cursor run-on. And it adds hands-free cursor navigation to any application.

If you use 1-2-3, Symphony, dBASE, Reflex, or Paradox, you need Cruise Control's Anti-Skid Braking. Here's what the leader of one Lotus users group said about Cruise Control:

"Once I used it, I wanted it! Excellent idea. Very practical. One of the best programs ever sent to us for review!"

If you use Word Perfect, MS-Word, Q&A, DisplayWrite, MultiMate, WordStar 2000, Framework, PC-Write, or SideKick, you need Cruise Control's Screen Runner, the high-performance, adjustable-speed cursor.

Cruise Control's namesake feature takes the drudgery out of paging through data base records, long documents, and large spreadsheets. It lets you repeat any key, hands-free — at the speed of your choice.

And there's more. A Chronometer "types" the time or date into your application at the current cursor position. The keyboard-controlled Screen Dimmer protects your privacy. The programmable Auto-Dimmer extends the life of your display screen.

Compatible with thousands of today's popular programs, including Lightning, SuperKey, and Ready!. Uses only 3K RAM. For DOS 2.0 or later. Not copy-protected. No risk, 60-day money-back guarantee.

Cruise Control™

From now until 3/31/87:

Only \$29.95.

Call now to order by credit card (VISA/MC/AX):

201-366-4445

Or, mail \$29.95 plus \$3.50 shipping and handling to:

**Revolution
Software, Inc.**

715 Route 10 East • Randolph, NJ 07869

Dept. 300

(For More Information Circle 151)

1-2-3® or Symphony® data + 1,2,3 FORECAST! = Information

Information you can use to manage sales, inventories, budgets,
production. Information you need to keep your business competitive.

A complete forecasting system for Lotus users. Trends. Regression.* Seasonal adjustments. Exponential smoothing. Moving averages. Decomposition analysis. Menu-driven with full graphics and data management. Tutorial. Fully documented. Easy to learn and use.

But don't just take our word for it!

"A powerful and straightforward forecasting tool for anyone who uses 1-2-3 or Symphony." (LOTUS, 1-86)

"Performs like some dedicated . . . programs costing \$400 or more." (PC World, 4-86)

"Will interact with your 1-2-3 or Symphony programs and teach you forecasting in the bargain." (Absolute Reference, 3-86)

"A little gem." (PC Magazine, 6-85)

*1A & Symphony versions have two explanatory variables. Release 2 version has 10 explanatory variables.

1-2-3 and Symphony are registered trademarks of Lotus Development Corp.

Three versions for all Lotus users (please specify):

☒ for 1-2-3, Release 2
Scientific as well as business applications
\$89.95 postpaid U.S.A.

☒ for 1-2-3, Release 1A
\$75.00 postpaid U.S.A.

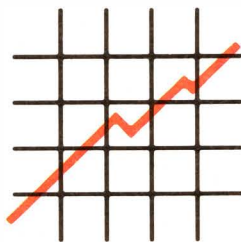
☒ for Symphony 1.0 or 1.1
\$75.00 postpaid U.S.A.

Major credit cards and company PO's accepted.

(For More Information Circle 182)

1,2,3 FORECAST!

P.O. Box 12582
Salem, OR 97309
(503) 585-8314



(For More Information Circle 181)

LETTERS

a number of software entrepreneurs, would have shed a much clearer light on the health and prognosis of AI.

In an effort to quickly capitalize on the romance and intrigue of AI, software developers such as those you interviewed are pedaling little more than "smart data bases," what the market refers to as expert systems. The goal of AI is much more than that, however.

According to Dr. Simon, who with Allen Newell developed the first AI computer program, called Logic Theorist, in 1955, the goal of research is not just to get computers to think smart, but to get them to do smart things by simulating the processes the mind uses in problem solving. Simon's AI research, which encompasses the fields of cognitive psychology, linguistics, computer science, and neuroscience, involves learning—getting computers to assimilate and accommodate for experiences and to apply this "knowledge" to novel situations, much the same way we do.

It's time to call a spade a spade. Let's limit the use of the AI label to the "real thing."

Richard Courcelle
Rutland, VT

COMPUTERS AND LEARNING

The article, "The Impact on Today's Children" (EDUCATION, October) was generally well written and informative. I agree, particularly, with the concern that the use of personal computers in schools—at the lower grade levels, at least—could lead to personal computers being used by teachers in much the same way that some parents have used TV—that is, to abrogate much of their own responsibilities for teaching the 3 Rs and other traditional subjects.

Should personal computers merely be teaching/learning tools for other subjects, or can a young child, say under the age of 10, be taught to use a personal computer for its own sake—for example, use of the everyday DOS commands, or some of the easier, more user-friendly software? I see no reason why not, and I'm sure some of them already have.

Penny C. Weiss
New York, NY

Letters to the Editor, with the writer's name, address and daytime telephone number, should be sent to: Letters Editor PERSONAL COMPUTING, 10 Mulholland Dr., Hasbrouck Heights, NJ 07604. Letters may be edited for reasons of space and clarity.

Desktop Publishing.

\$149⁰⁰

Multimate, WordStar. You've already spent 90% of what's needed for a powerful personal publishing system with your *current* software and LaserJet. Just a bit more for *Ram-Resident PrintMerge* will bring it to life.

Call 800/338-5943 (In CA 800/231-3531)
Toll-Free for *Ram-Resident PrintMerge* Ordering
Information for IBM PC/ATs and 100% compatibles.
30-day no-risk money back guarantee.

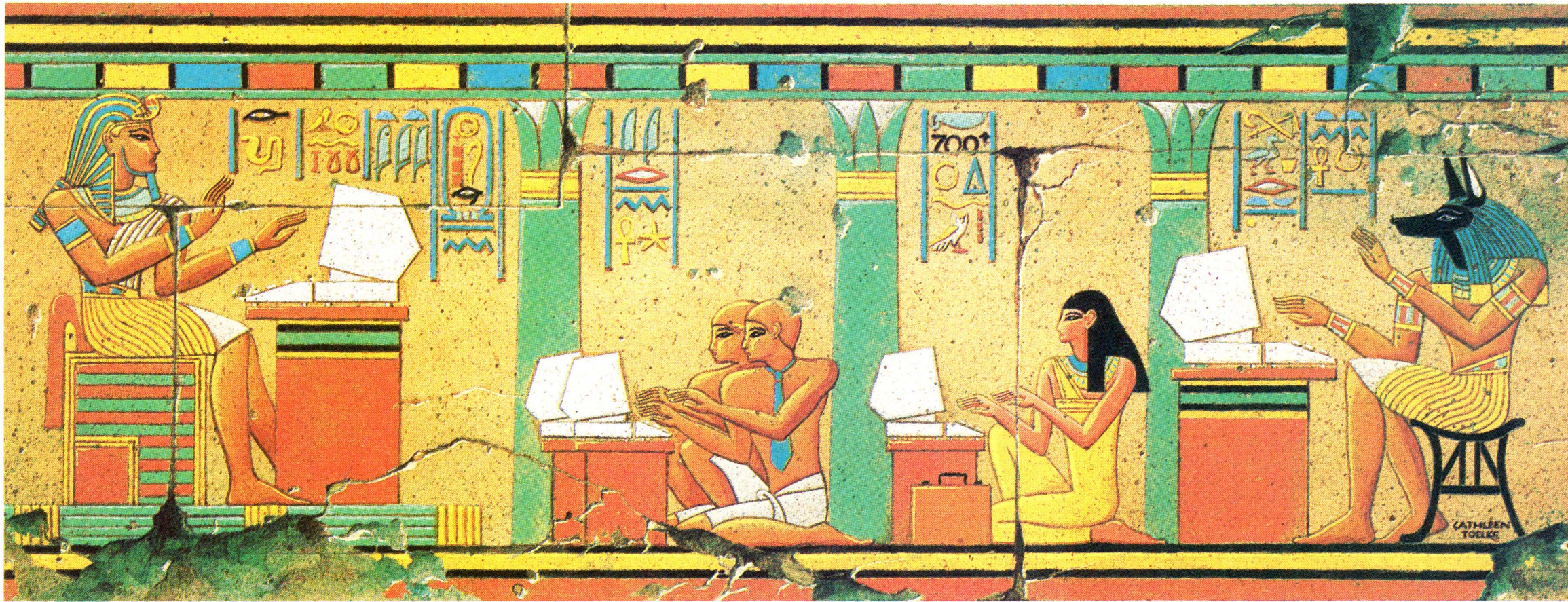
POLARIS
SOFTWARE

Hewlett-Packard's LaserJet created desktop publishing. *Ram-Resident PrintMerge* brings it to life. It does true proportional spacing and justification. With *any* font combination. You can merge text with screen or output graphics from other programs. Draw lines or boxes. Align proportional tab columns. *Only* PrintMerge offers these unique capabilities. You print directly from virtually *any* program including: dBase, DisplayWrite3, Lotus 1-2-3,

Recommended by
 HEWLETT PACKARD

(For More Information Circle 167)

InfoMaster[®] service civilizes electronic information.



So anyone can use it.

Until now, electronic information services were a lot like hieroglyphics. Only a privileged few could make head or tail of them.

Now there is InfoMaster service—the extraordinary database system from Western Union that civilizes electronic information. Finally, it has become a practical, easy-to-use, business-building tool.

See alternatives from a wider perspective. Feel really prepared.

Whatever business you're in, InfoMaster makes critical information immediately accessible. Timely, comprehensive information. About your business. Your market. Your prospects. Your competition.

With InfoMaster, you spend less time looking for information...have more time to think about it. This can make a big difference in your reports, presentations, recommendations, decisions. Not to mention your career.

Not just the world's richest source of information. The easiest to use, too!

InfoMaster puts the world's leading on-line services—BRS, Dialog, NewsNet, TRW, Vu/Text and more—at your fingertips. Over 700 databases. All through a single source.

Quite civilly, InfoMaster eliminates the obstacles that prevented you from taking advantage of electronic information in the past. Imagine...there's no computer-ese, no commands to learn, no training needed. InfoMaster works using simple phrases.

You don't even have to know which database to choose. InfoMaster acts as your guide...leading you there, one easy step at a time. There's even free on-line assistance from a specialist, 24 hours a day. So you're never alone.

One more thing. You can use InfoMaster with any PC or terminal. No advanced communications software is needed.

Discover civilization for yourself! Sample InfoMaster right now—FREE!

There's no faster, better way to see how InfoMaster can work for you than by experiencing it for yourself right now—FREE. So phone or mail in the coupon today.

Call now for your Complimentary Password.
Then get on-line and experience InfoMaster FREE.*

1-800-247-1373

Dept. 501

InfoMaster[®]
western union

Request your Complimentary Password by phone or mail. Sample InfoMaster—FREE.

- ☐ YES! I want to sample the world's largest electronic information source—FREE. Please provide me with a complimentary password so I can log-on to InfoMaster without charge or obligation.
- ☐ I just want more information at this time. Please send me a FREE InfoMaster Kit.

NAME _____ TITLE _____

COMPANY _____

ADDRESS _____

CITY, STATE, ZIP
() _____

TELEPHONE _____

Mail to: InfoMaster, Dept. 501
4230 Alpha Road, Suite 100, Dallas, TX 75244-4401

(For More Information Circle 29)

© 1986 The Western Union Telegraph Company.

A103

*Respond now and receive a FREE full-color InfoMaster poster.

Tech Personal Computers Inc.

Tech PC Twin Multiuser Starting From \$1699

Tech PC/88® base unit with 640K, and two 360K disk drives.

Two high resolution monitors, two selectric style keyboards, 50 feet of shielded cable to separate the two stations.

System supports up to six printers.

Full software support with multi-level file, security, electronic message facility to send and receive messages between users, password logon system, and system operator command level. System supports all popular software such as Wordstar™, dBaseIII™, Lotus 123™, Multimate™, etc.

Tech PC Triad Multiuser Starting From \$2599

Tech PC/88® base unit with 640K, and two 360K disk drives.

Separate Intel 80188 microprocessor running at 8 MHz and 512K for each terminal.

Three high resolution monitors, three Selectric™ style keyboards, 50 feet of shielded cable to separate the three stations.

System expandable to 32 workstations.

System supports up to six printers.

Full support for multitasking multiterminal use with print spooling for multiple printers, background monitoring of the system, dial up bulletin board support, password protection, and file/record locking supporting PC Network™ protocol.

System supports all popular software such as Wordstar™, dBaseIII™, Lotus 123™, Multimate™, etc.

Tech PC Quad Multiuser Starting From \$4499

Tech Turbo PC/286® base unit in portable or desktop configuration with 256K, multiple serial ports, three Tech PC terminals, connecting cables, and networking software.

Four users expandable to nine users over dumb terminals or PC's with terminal emulation software.

Capacity for up to 16 printers at remote sites with up to 6 local printers attached to the main unit.

Each user can access 512K of RAM with memory expansion boards.

Full support for multitasking multiterminal use with print spooling for central or terminal printing, background monitoring of the system, dial up bulletin board support, password protection, and File/Record locking using

PC Network™ protocol.

System supports all popular software such as Wordstar™, dBaseIII™, Lotus 123™, Multimate™, etc.

Tech PC Turbo Quad Multiuser Starting From \$5999

Tech PC/88® base unit in desktop configuration with 640K, multiple serial ports, three Tech PC terminals, connecting cables, and networking software.

Separate NEC™ V20 8088 Intel™ compatible 8 MHz CPU and up to 1 MB RAM for each terminal on the system.

Two fully functional serial ports per terminal.

Four users expandable to 32 users over dumb terminals or PC's with terminal emulation software.

Capacity for unlimited number of local printers.

Full support for multitasking multiterminal use with print spooling for multiple printers, background monitoring of the system, dial up bulletin board support, password protection, and File/Record locking supporting PC Network™ protocol.

System supports all popular software such as Wordstar™, dBaseIII™, Lotus 123™, Multimate™, etc.

From the Leader in Quality, Performance, and State of the Art Computer System Engineering...

Introducing... A New Profile Desktop Series of IBM XT® Compatibles.

The PC II Series of IBM XT compatible computers are designed to provide enhanced capacity and processing power to XT type computer systems. Combined with a 12 inch, 800 by 400 line amber monochrome monitor or a 14 inch, 1280 by 800 black and white monochrome monitor you've got state of the art staring straight back at you. If 4.77 MHz 8088 power isn't fast enough for you... Try the Tech-Turbo PC/88 II® with its 4.77 to 8 MHz 8088 or optional V20 CPU. The Tech-Turbo PC/88 II gives you the strongest most powerful 8088 unit performance available from anyone, anywhere... Need some heavy duty memory, order the unit with 2 to 8 megabytes of expanded memory... Your choice. How about hard disks... We've got those too.

At Tech PC we're out to capture your corporate microcomputer business. No one matches our diverse line of high performance products, or our comprehensive system of support, warranty, and third party maintenance service options through Momentum Service Corporation.

Call or write Tech Personal Computers for more information on our full line of Desktop, Portable, Multi-User Computer Systems and Computer System Accessories.

Tech-Turbo PC/88 II® \$629.00 Gives You:

19 Inch Desktop Sized Sturdy Case
4.77 to 8 MHz 8088 CPU
8087 Math Co-Processor Socket
640K RAM
Floppy Disk Controller
One, 360K Floppy Drive
Eight 8 Bit Expansion Slots
150 Watt DC Fan Power Supply
AT Style Soft-Touch Keyboard
One Year Warranty
Third Party Maintenance Options

\$829.00 Gives You:

Tech PC/88 II Turbo System with Monochrome Monitor, and Hercules® Compatible Mono/Graphics Card.

\$1279.00 Gives You:

Tech-Turbo PC/88 II System with Monochrome Monitor, Hercules® Compatible Mono/Graphics Card, and 20 MB Hard Disk.

Complete MS-DOS, PC-DOS, Xenex Compatibility

Runs Lotus 123®, dBase III®, Framework®, and All Other XT® Software.

Tech PC/88 II® \$529.00 Gives You:

19 Inch Desktop Sized Sturdy Case
4.77 MHz 8088 CPU
8087 Math Co-Processor Socket
640K RAM
Floppy Disk Controller
One, 360K Floppy Drive
Eight 8 Bit Expansion Slots
150 Watt DC Fan Power Supply
AT Style Soft-Touch Keyboard
One Year Warranty
Third Party Maintenance Options

\$729.00 Gives You:

Tech PC/88 II System with Monochrome Monitor, and Hercules® Compatible Mono/Graphics Card.

\$1179.00 Gives You:

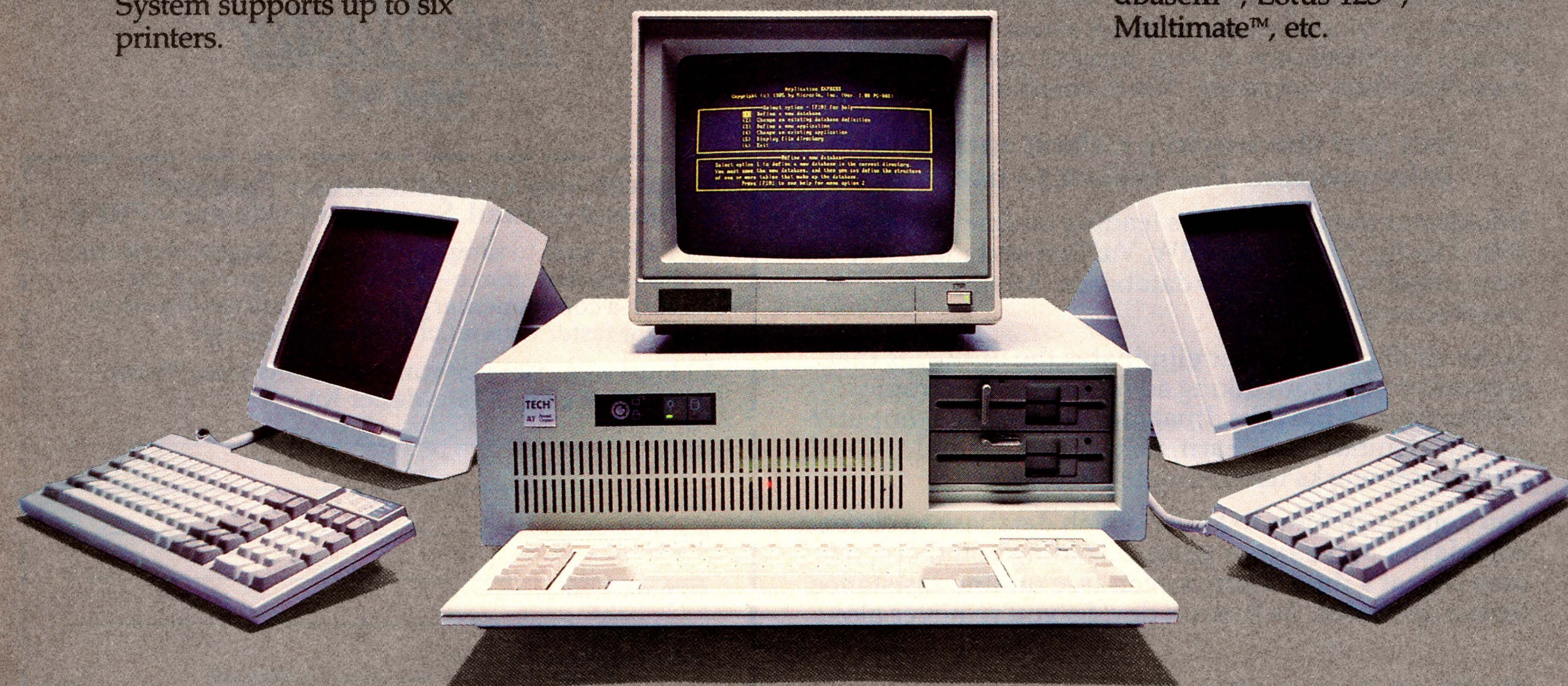
Tech PC/88 II System with Monochrome Monitor, Hercules® Compatible Mono/Graphics Card, and 20 MB Hard Disk.

**THIRD PARTY
MAINTENANCE OPTION
AVAILABLE THROUGH
MOMENTUM SERVICE
CORPORATION**

TECH PC

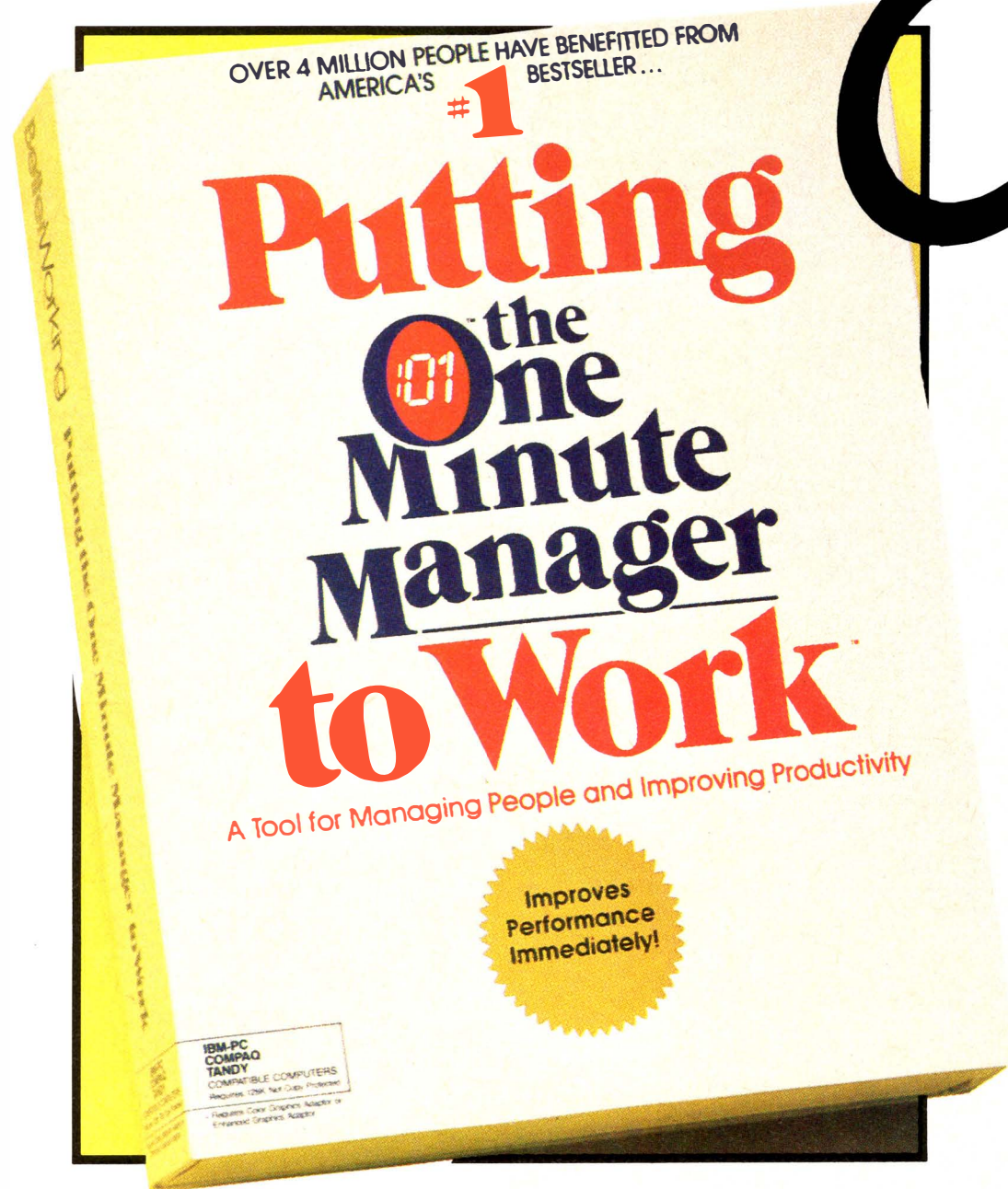
(714) 385-1711

1911 Betmor Lane, Anaheim, California 92805
Telex 272006 Answer Back - TECH FAX: 7143851523
(For More Information Circle 33)



Tech PC/88 II, Tech-Turbo PC/88 II are registered trademarks of Tech Personal Computers, Inc.

Successful Teams.



Can A Computer Program REALLY Increase Your Productivity By More Than 30 Percent?

Introducing PUTTING THE ONE MINUTE MANAGER TO WORK. An important new software tool that actually improves the productivity of you and your employees — within the first hour that you use it.

Jan 15 88 12:48 AM INVOLVE CHANGE

PINPOINT Company Driving Accidents Date: 01/15/88

TEAM MEMBER Ron Anders

GOAL Train 425 of our 426 drivers

MEASUREMENT CRITERION

PERFORMANCE LEVELS Outstanding 425 Acceptable 400
Minimal 375

INCENTIVES Selection of manager of the year

TRACKING RESPONSIBILITY Ron Anders TRACKING FREQUENCY

THIS GOAL'S PRIORITY FIRST REVIEW DATE (7, 10 days away)
01/25/88 (1, 5, 1 is highest)

CONDITIONS Drivers allowed to attend class during work hours

ACTION STEP 1 Create video tape
2 Schedule classes
3 Sign up drivers
4 Give diploma to drivers
5 Post graphs of safety record

F1	F2	F3	F5	F9	F10
SAVE	CLEAR ENTRY	RESTORE ENTRY	PRINT SCREEN	DON'T SAVE	HELP

Involve your employees in creating action plans.

"It's straightforward, concise and it works!"

*William A. Andres
Chairman
Dayton/Hudson Corporation*

This computer program was designed by Ken Blanchard and Robert Lorber, co-authors of the One Minute Manager books that have been read by over four million business men and women. PUTTING THE ONE MINUTE MANAGER TO WORK is based on the P-R-I-C-E system for identifying and reaching management objectives. First you PINPOINT an area for improvement, then RECORD the past and present performance measurements. You then INVOLVE your employees in designing action plans, and you systematically COACH them on their efforts. Finally, you EVALUATE your team's progress toward the desired objective.

Sound simple? It is more than simple. At each step of the P-R-I-C-E system you are taught all the concepts you need to know. And even better, you are provided with a useful set of specially designed productivity tools to assist you in using the P-R-I-C-E system as a One Minute Manager. No computer experience is necessary to become adept at using the program. On screen help guides you effortlessly through all the steps. Within one hour, you'll have set specific, measureable goals. After one week, you'll have action plans and commitment from your employees. And by the end of the second week, you'll be following up on the progress you've made.

Does it work? PUTTING THE ONE MINUTE MANAGER TO WORK was years in development and has been tested by hundreds of managers in situations just like yours. *Managers who have used the program report an improvement of over thirty percent in their productivity and that of the people they manage.* They are doing more of what they do, doing it better, at lower cost, with higher quality, and greater satisfaction.

What is a thirty percent improvement worth to you and your company? More than \$99.95. This could be the best investment you've made today.

BetterWorking
From Spinnaker®

Putting the One Minute Manager To Work works with DOS 2.1 or higher, and is designed for the IBM PC, Tandy 1000, Compaq or other compatibles. Requires Color Graphics Adaptor or Enhanced Graphics Adaptor.

Available at fine software dealers listed on page 176 or call 1-800-826-0760
In Illinois 1-800-826-1330

The jury is in...the verdict is **MINDREADER**

MindReader is a smash hit with the PC reviewers, and the favorite of thousands of users. Why? Because it's the first software product to use Artificial Intelligence to make real world business writing a breeze!

MindReader is an absolutely unique writing product especially designed for the business user. It gives hunt-and-peck typists exactly what they need to do real world correspondence, leaving WordStar and MultiMate for the fast production typists.

MindReader combines top performance, certified by the PC industry's most respected reviewers, with an astoundingly low price of **\$65.00**.



THE NEW GENERATION

MindReader's amazing abilities come from the fascinating new world of Artificial Intelligence. With it, you don't have to be a skilled typist in order to write. **Just type the first few letters of a word, and MindReader finishes it for you.** Plus you can expand its comprehensive dictionary with your own business words and phrases.

MindReader's one touch approach makes you feel like you are creating correspondence at lightning speeds. Touch one key and a complete name and address, or a whole paragraph of boilerplate, or a lengthy phrase, or an entire signature block appears. No more tedious typing of material you use everyday.

WRITING FOR THE REAL WORLD

MindReader gives you what you use most in business writing—mail merge, labels, envelope printing and powerful but easy-to-use editing functions.

Real business writing isn't a 30-page document with footnotes. More likely, it's a 1½ to 5-page letter with name and address, original text, paragraphs of boilerplate, a few phrases and a close. With MindReader, a real business letter can be created in minutes!

**"EDITOR'S
CHOICE"
PC Magazine**

"The sort of technological breakthrough we don't normally expect in this business."

PC Magazine, January 28, 1986

"And for the hunt and peck typists of the world, it may be the greatest thing to come along since Liquid Paper."

PC Week, March 4, 1986

"Basically what this thing does is write for you—believe it or not."

John C. Dvorak, InfoWorld, September, 1985

"The only package that can accurately be described as an intelligent word processor."

PC Products, November, 1985

"Almost supernatural in the way it enables you to type out words and phrases at the touch of a single key."

Writers Guild of America, March, 1986

"Only those who reject the very concept of computers would be prone to resist it."

Computer Buyer's Guide and Handbook, January, 1986

"One of the best word processors for beginners and casual users to appear in several years."

Science Digest, February, 1986

plus raves from Personal Computing, PC World, Family Computing, Micro Marketworld, Computer + Software News, USA Today, Kiplinger's Changing Times and many others.

WORD PROCESSING POWER

MindReader's powerful word processor has all the standard features for manipulating text, plus many advanced features you see only in more expensive packages. Global search and replace, ASCII format, cut-and-paste, line and block drawing, encryption, and keyboard macros are all there.

ESSENTIAL DESKTOP ACCESSORIES

MindReader also sets the pace with fully integrated Desktop Accessories, including a 60-day Scheduler, Telephone Directory, Calendar, and Calculator. All can easily be used, without manuals or exotic codes.

All those wonderful things the reviewers say about MindReader are true! It's a glimpse into the future of word processing. Join this exciting new generation, by ordering MindReader today!

To order, use the coupon or call toll-free
800-843-6964

for information, or in the state of Maryland, call 301-263-1962

Runs on IBM PC, XT or AT, or 100% compatibles, with minimum 256K system memory and DOS 2.0 or higher.

MINDREADER
Artificial Intelligence for Business Writing

Yes! I want to use the new generation, to make writing a breeze! Please send MindReader at the great price of

\$65.00

_____ copies @ \$65.00
Price includes shipping to all U.S. cities.
Outside US, add \$10 per copy
Maryland res. add 5% sales tax (\$3.25)

Total: \$ _____

Total enclosed: _____

Payment: VISA _____ MasterCard _____ Check _____

Credit card expiration date: _____

Card Number: _____

Name: _____

Shipping Address: _____

City: _____ State: _____ Zip: _____

Telephone () _____

MindReader, from Businesssoft, Inc.
703 Giddings Ave., M-4, Annapolis, MD 2104

MindReader is a trademark of Businesssoft, Inc. U.S. Patent #4,566,065. IBM is a registered trademark, and PC, XT and AT are trademarks of International Business Machines Corporation.

Nobody's Perfect...

Game	Winner	Time to Move
1	SARGON III	5 seconds
2	SARGON III	5 seconds
3	SARGON III	15 seconds
4	SARGON III	15 seconds
5	SARGON III	30 seconds
6	Chessmaster	30 seconds
7	SARGON III	3 min
8	SARGON III	3 min

YOU CAN'T WIN THEM ALL.

We pitted Sargon III, the world champion, against the challenger. Head to head, with no punches pulled. And believe it or not, the champ lost one game to the challenger. But Sargon III beats Chessmaster 2000 almost everytime.

Sargon III is the result of more than twenty one man years of development. Sargon III will play at precisely the level of difficulty you desire. Ask Sargon III for a hint, take back a move you've already made, replay a sequence, change sides, or set up your own board for customized learning. Sargon III lets you study in detail more than 100 great games of history or review 45 classic chess problems,

all on screen. Sargon III also includes the largest library of opening moves available on any chess program.

SARGON III WRITES CHESS HISTORY

In a tournament sanctioned by the U.S. Chess Federation, Sargon III beat

a master rated 2209. That makes Sargon III the only microcomputer program ever to defeat a player at that level.

Sargon III has no trouble wiping Chessmaster 2000 off the globe. Someday, maybe a chess playing program will be able to beat Sargon III. Until then, which chess program do you want to own: the world champion or the runner-up?

(Note: The test was run on two Apple II computers. Each program played once as white and once as black at each level. Send us \$5.00 for handling, along with a postage paid return envelope and we'll send you a copy of the moves each side played.)



Sargon III is available for: Apple II series, Apple Macintosh, IBM PC and Commodore 64/128 computers. You can find Sargon III at your local retailer or call 1-800-826-0706. Illinois residents call 1-800-826-1330. Only MasterCard, VISA and American Express accepted for phone orders.

HAYDEN
SOFTWARE
A division of Spinnaker Software

**Limited
time offer!**
Trade up to TAS-Books
and save \$10!

TAS-Books VS. Dac-Easy

	DAC	TAS-Books
Full price including Payroll, G/L, A/R, A/P, Sales order/Invoicing/P/O/Inventory & Tutorial	\$159.75	\$99
Written using 4th generation language	NO	YES
Source code included/modifiable	NO	YES
Easy-to-change file structures	NO	YES
Report generator	NO	YES
Multi-user option available	NO	YES
On-line help messages	NO	YES
3-yrs. GL data by month	NO	YES
Create mail/merge files	NO	YES

**Feature for feature, dollar for dollar,
TAS-Books wins, hands down!**

TAS-Books gives you more for your money.

Before you buy DAC Easy accounting software (or if you already have), you should know what you could have instead.

You could have software that changes — easily — to fit your accounting system, instead of the other way around. You could have a program that includes payroll and a full-featured data base at no extra charge.

If you've already bought Dac-Easy, you can still trade up to TAS-Books, and get an additional \$10 off the price!

TAS-Books adapts to fit your business.

Accounting systems are not all alike. That's why TAS-Books is written using the popular TAS-Plus 4th generation language/relational data base, with source code included. So you can easily customize TAS-Books to fit your business.

TAS-Books does so much, so easily.

TAS-Books gives you full audit trails and integrated modules, with sales and purchase histories updated automatically. You can review up to 3 years of GL data by month. Plus all the usual accounting functions. And you get a tutorial, and on-line help messages in each field.

Here's what TAS-Books offers you:

General Ledger

- 3 years of data by month
- Full audit trails
- Post to previous periods and reclose
- Budgeting by month
- Flexible financial statement setup/printing

Accounts Receivable

- Open item
- Mailing labels and rolodex cards
- Detailed history of sales, costs, and net
- Statements
- Ageings

Accounts Payable

- Easy to enter invoices/vouchers
- Enter checks written by hand and/or print out checks automatically
- Mailing labels and rolodex cards
- History of purchases

Payroll

- Easy to run
- Produces all necessary information
- Prints W-2 forms
- Allows for employee reimbursement without tax

Inventory

- Averages cost and records last cost
- Adjusts physical quantity
- Uses fractional quantity
- Keeps track of non-inventoried items
- History of sales, cost, and net
- Adjust cost
- Each item can have its own SALES and COGS GL account

Invoicing/sales order

- 99 items per order
- Description lines added easily
- Credits may be mixed on same order
- Discount for any line
- Ship to may be loaded from customer file

Purchase order

- 99 items per order
- Description lines added easily
- Credits may be mixed on same order
- Discount for any line
- May order non-inventoried items

**Plus many reports and
other features too
numerous to
mention!**

Full-featured database gives you real versatility.

No need to buy an expensive data base to interface with TAS-Books: it's included at no extra charge! So you can easily generate customized reports and create mail-merge files. No need to preallocate files. TAS-Plus does all the hard work for you! And if you're already using DAC Easy, TAS-Books will translate your current files.

**Order today
1-800-648-6258.**

Call our Toll-Free Hotline. Use your VISA, MasterCard or American Express to order today. For information or Washington residents call 1-206-644-2015.

TAS-Books is available for the IBM PC/XT/AT and fully compatible computers.

Money-back guarantee!

Try TAS-Books for 30 days. If it's not exactly what you've been looking for in accounting software, just send it back. You'll get a full refund (less \$15 handling fee).

TAS+™

NOT COPY-PROTECTED

Trade up to TAS-Books.

Send us the title page from your Dac-Easy manual. We'll send you TAS-Books at an additional \$10 off its money-saving price. Limit one discount copy per customer. Offer ends March 31, 1987.

YES! I want powerful, user-friendly accounting software, with easy-to-customize coding and its own full-featured data base. And I want to save money over programs that offer me a lot less. Rush me TAS-Books now!

Quantity	Subtotal
_____	_____
@ \$99 ea.	_____
Shipping: \$8 U.S. \$25 outside U.S.A.	_____
Trading in DAC? Subtract \$10!	_____
WA residents add 8.1% sales tax.	_____
TOTAL	_____
(U.S. funds only)	

Name: _____

Shipping address: _____

City: _____

State: _____ Zip: _____

Telephone: _____

Payment (circle one): VISA MC AMX Check

Credit Card Expiration Date: _____

Card Number: _____

Name on Card: _____

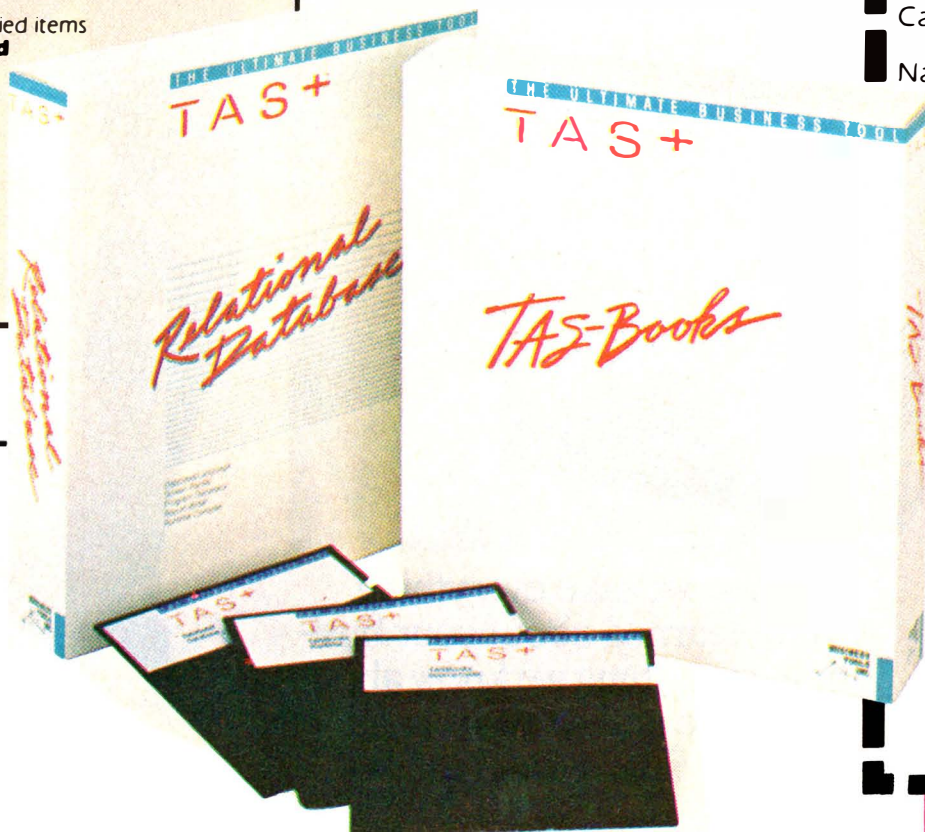
**BUSINESS
TOOLS
INC.**

4038-B 128th Ave. S.E.
Suite 266
Bellevue, Washington 98006
(206) 644-2015

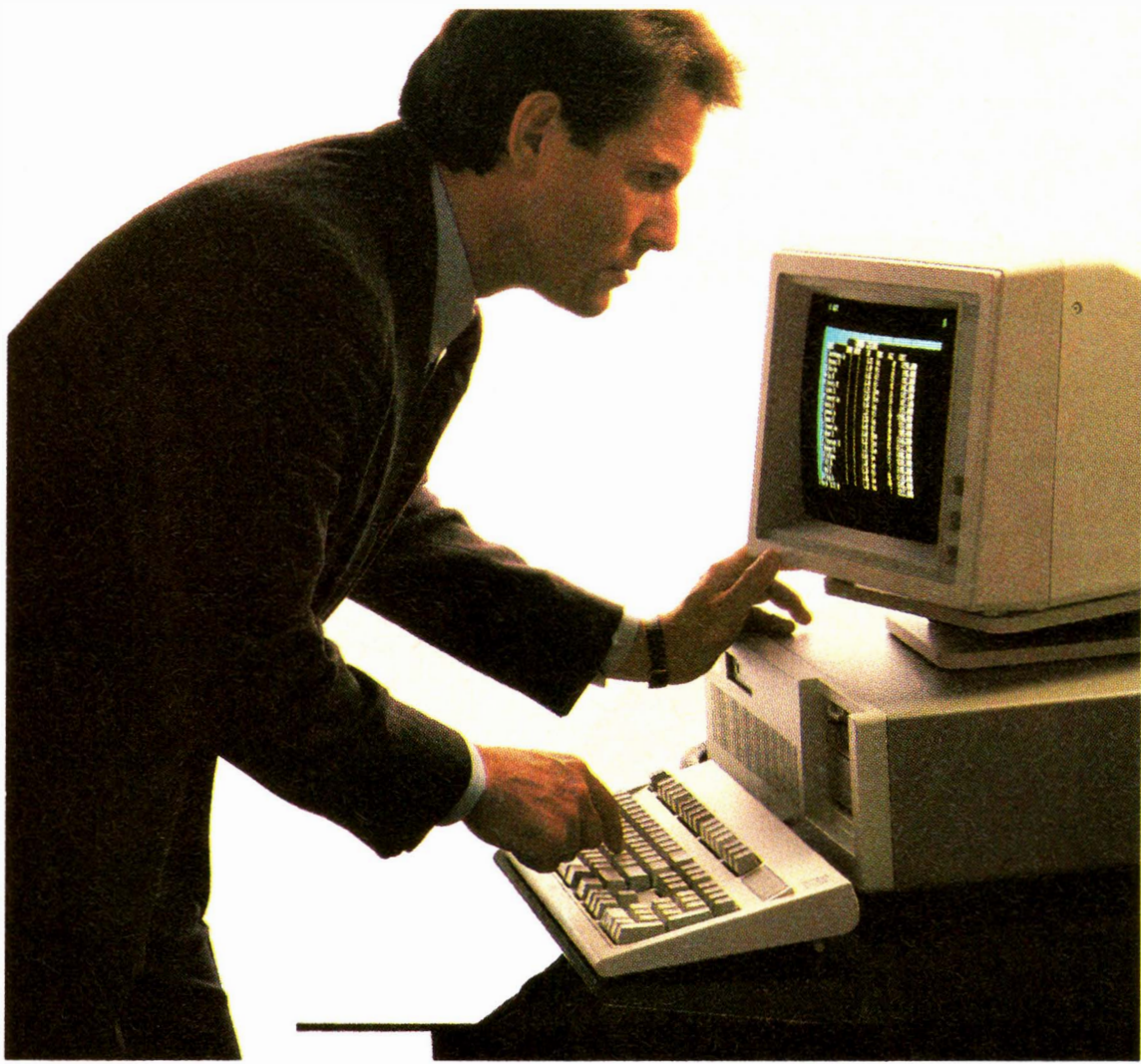
The following are registered trademarks of these companies: TAS-Plus, The Accounting Solution, TAS-Books, Business Tools, Inc.; IBM PC/XT/AT, International Business Machines Corp.; Dac-Easy, Dac Software, Inc.

© 1986 Business Tools, Inc.

(For More Information Circle 2)



Entré. The brains behind business computers.™



We take the time to understand your business. How else can we stand behind what we sell?

Computers are not a miracle cure. Buying computer equipment with a famous name (or even initials) doesn't guarantee your office will become a paragon of efficiency and productivity overnight.

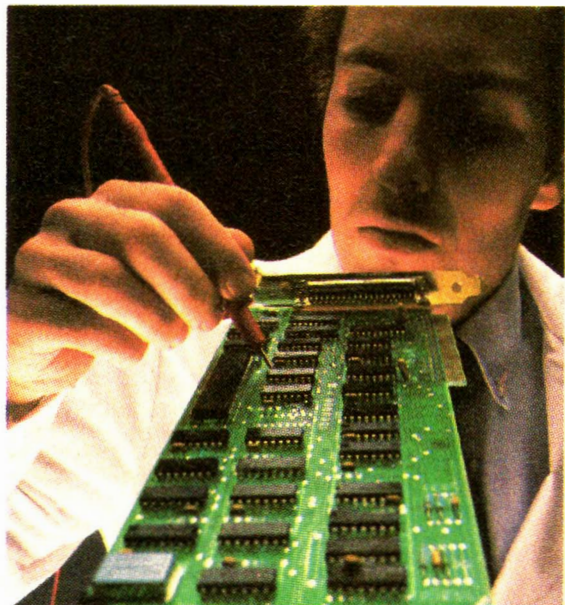
To get a system of value to your company, you should buy it from someone who not only

understands the technology, but understands why you need it. You should buy it from Entré.

Before we sell you anything, we find out exactly what problems you expect your new system to solve. And what changes you see for the future.

We get to know the people who'll be using the new system. We listen to their anxieties, and give them information to make the transition from pencil to print-out easier.

We spend hundreds of hours each year in new product seminars and classes. Our expertise grows as quickly as technology changes.



Then we take everything we've learned about your business, everything we know about hardware and software, and configure the system that's

right for your office. This is where the brains come in.

The owners and management of Entré Centers grew up with the industry, having trained and worked for years with computer manufacturers whose products are now office standards.

Last year alone we installed 75,000 systems, including more than 1,000 Local Area Networks, nearly 1,000 CADD systems and nearly 5,000 business accounting systems.

We designed them from an inventory of more than 2,800 of the most sophisticated products available, from more than 160 manufacturers. We configure only from the products proven to work best together. Experience has

Because Entré Centers are locally owned and operated, we care about the success of your business. If we didn't, we'd hear about it at the next PTA meeting.



We often do repair and service right at your office. So you get your money's worth out of your system. And your payroll.

taught us exactly what each product can do, and what it can do for your company better than anything else.

When Entré pretests and installs a system, you can depend on it to work. And on our outstanding service to keep it working.

Entré offers a simple approach to a complex technology. We make it our business to understand computers, and understand you. Because it's the best way we know to hook you up with a system that does exactly what it's supposed to do.

At Entré, we don't use promises to get you into our centers. We use our heads.



There are more than 200 Entré Centers. Chances are, wherever you have an office, we have one, too.

Just call 1-800-356-7744 and we'll put our heads together. Business and individual financing plans are also available through your local center.

ENTRÉ
COMPUTER CENTERS™

© 1987 Entré Computer Centers, Inc. Entré Computer Centers are independently owned and operated.™ Trademarks of Entré Computer Centers, Inc.



We put together systems that last by matching up computer components that pass strict compatibility testing.



Lotus Takes The Offensive

Targets 1-2-3 Clones; Add-In Market

■ Lotus 1-2-3 is probably the king of the MS-DOS office, and the Lotus Development Corp., Cambridge, Mass., has every intention of keeping it that way. Lotus has initiated legal action to protect its preeminent market position against encroachment from two software clones. The company has also moved to enter the spreadsheet add-in market. Finally, a lawsuit that claimed Lotus was liable for errors in a Symphony spreadsheet was dropped.

The imbroglio over the "look and feel" of software spilled into federal court in mid-January when Lotus filed copyright infringement suits against Paperback Software International (the publisher of VP-Planner) and Mosaic Software, Inc. (the maker of Twin). Both companies manufacture and market clones of the Lotus 1-2-3 spreadsheet program.

The suits, filed in U.S. District Court in Boston, seek \$10 million in punitive damages from each company. Lotus claims that the competing products "deliberately recreate the 'look and feel' of 1-2-3 in violation of copyright laws, and imitate the structure and sequence of the 1-2-3 interface." Lotus says that Paperback and Mosaic are engaging in plagiarism in their use of a macro language similar to 1-2-3's and further charges in the suit that claims in the companies' advertising that the products are functionally identical to 1-2-3 are misleading because the clones run slower than 1-2-3 and don't make as efficient use of memory.

Lotus chairman and president Jim Manzi says that Lotus has a responsibility to its customers, shareholders, and the industry "to take a leadership role in protecting intellectual property." The successful prosecution of clones, he adds, would help channel the energy of the computing industry "away from imitation and toward new breakthroughs."

Reached in London, Adam Osborne, president and CEO of Paperback Software, said, "I can't believe my ears. To sue 18 months after we came out with our product is ridiculous. It's because our sales are eating into theirs." Osborne claims more than 100,000 copies of VP-Planner have been sold. It is Paperback Software's best-selling product.

Manzi countered by saying that 1-2-3 sold more copies during the last quarter of 1986 than it has in any quarter since it was released four years ago.

"They [Lotus] themselves copied VisiCalc, and many people use their product on cloned IBM computers that copied the IBM BIOS," Osborne said. "We copied the spreadsheet portion of Lotus 1-2-3 and vastly enhanced the program as Lotus itself had with VisiCalc. The only difference is that we

sharply dropped the price." He says that VP-Planner's data base functions are superior to those available with 1-2-3. VP-Planner sells for \$99.95 and Twin retails for \$149.95, while 1-2-3 carries a suggested price of \$495.

In the software add-in arena, the day before independent developers were due to unveil 16 add-in products for 1-2-3, including four pop-up word processors, Lotus was privately showing its own desktop accessory program, Metro, which includes a clip-in word processor.

(See "Buyers Guide To Spreadsheet Add-Ons," in this issue.)

Why would you also need the new 1-2-3 add-ins such as 4Word from Turner Hall or Inword from Funk Software? Conall Ryan, the product marketing manager who demonstrated the Lotus product in the company's New York offices, searched for the correct words. "You don't," he eventually said. The developers' other text processors are PlusWords (Amazon Systems) and Write-In (Blossom Software).

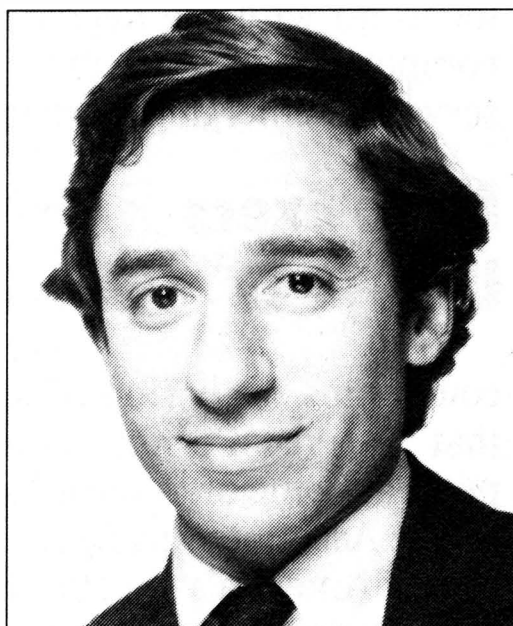
Paul Funk, president of Funk Software, the maker of Sideways, said, "I haven't seen Metro, and it sounds interesting, but I doubt it's as easy as having an add-in."

The add-ins are the first fruits of the 1-2-3 Developers' Tools made available by Lotus to independent developers last year. The products tie directly into 1-2-3's programming code and work only with 1-2-3. Metro, on the other hand, can be RAM resident with a variety of applications.

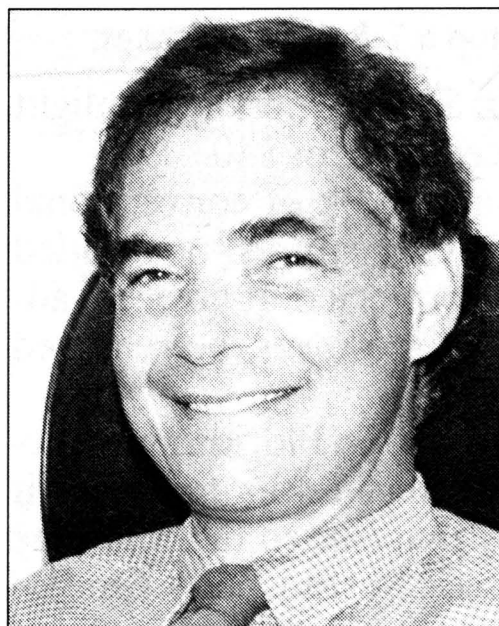
Metro is much more than a simple word processor. It includes the desktop accessory features found in products such as SideKick and the macro-generator capabilities of programs such as SuperKey. Metro replaces Spotlight, which Lotus had been selling since its acquisition of Software Arts.

Metro's Text Editor includes basic word processing capabilities using the familiar one-line 1-2-3-style commands at the top of the screen with brief descriptions on the next line. The Clipboard can cut and paste text into a particular column. The Clipboard also formats information for use in word processors and spreadsheets.

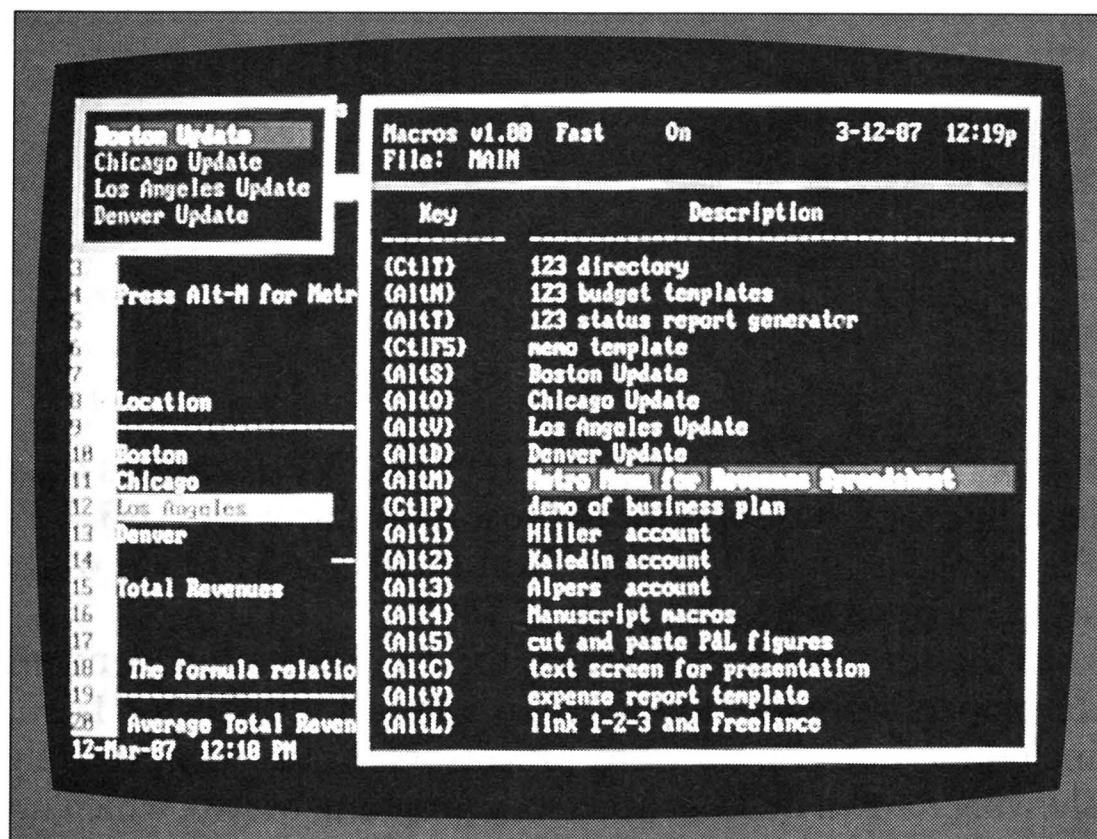
Metro offers a slew of other features, among them a DOS file manager, a list manager with outlining and sortable "to do" lists, and a Calculator with some popular @Functions such as Net Present Value built into the on-screen buttons. (The Calculator does not have an on-screen tape for reviewing previous calculations.) Also included are a Phone Book (with Hayes-compatible auto-dialer); a 112-line Notepad for attaching notes to a 1-2-3 cell or a Symphony word processing document; and a Watch, which tracks billable phone consultations and amount of time spent on up to 100 different projects.



JIM MANZI: "We must protect intellectual property."



ADAM OSBORNE: "To sue after 18 months is ridiculous."



Metro's Macro manager overlaid atop a 1-2-3 spreadsheet.

Metro is available from Lotus for \$85. Owners of Spotlight can exchange their disks at a reduced price of \$40.

Metro consumes between 80k and 120k of conventional memory (depending on how many of its features you decided to use) and the program is not copy protected. It does not address expanded memory, but it can, however, be removed from RAM with two keystrokes.

And finally, James A. Cummings, Inc., a Florida construction company, withdrew its suit against Lotus for what it claimed was a defect in Symphony that caused the company to make a \$254,000 error (also see "Spreadsheets Can Be Hazardous To Your Health," January 1987). "We maintained from the start that there was no basis for the suit," said Lindsey Kiang, Lotus' general counsel. "There was no settlement and no money changed hands." Kiang said that the spreadsheet error was caused by a Cummings user when he inserted a line for overhead costs at the top of a column of numbers that were to be added. The number fell outside the @SUM range, and the construction company entered a bid that was too low.

All Hands On Deck

■ Quarterdeck Office Systems, of Santa Monica, Calif., has begun shipment of a new version of its Desqview control program, which currently enables true multitasking on MS- and PC-DOS computers, plus built-in macros and cut-and-paste functions. Version 2.0 adds improved support of both graphics-based programs and some of the advanced capabilities of the new Intel 80386 microprocessor. In addition, version 2.0 includes an Application Program Interface (API) that enables software developers to write programs using Desqview's capabilities—developers can even bundle a run-time version of Desqview with such programs.

The upgrade strengthens Quarterdeck's contention that Desqview is currently the program that makes the best use of the potential of the 80386 chip. Version 1.3 (released this past October) was the first such product specifically designed for the 80386. Microsoft's ADOS (Advanced Disk Operating System), the successor to MS-DOS 3.1, won't be available until IBM releases it, and current indications are that this won't happen before autumn. Even when ADOS does appear, however, it's clear that the new operating system will be intended for use on 80286 rather than 80386 machines. In the meantime, Desqview provides multitasking now, although

companies such as Softguard and Phoenix Technologies are also readying 386 control programs. Microsoft, too, plans to begin shipping a 386 version of Windows before the end of the first quarter.

In its present form, Desqview has been holding its own, though certainly not winning the so-called "Windows Wars." Control programs such as GEM (Digital Research), Windows (Microsoft), TopView (IBM), and Desqview all claim the ability to run several programs concurrently, but none has established clear dominance. Although Desqview (like TopView) won't run graphics programs in a window, version 2.0 will be able to switch between graphics programs, though not run them concurrently. Desqview has found a niche as an aid to expanded memory boards. (It is bundled with AST's RAM-page product.) TopView and Windows, however, haven't yet defined a clear market segment, especially considering the size of the companies touting them. What happens next has a lot to do with the degree of market penetration by 80386 computers—and with the ability of the various contenders to serve that emerging market.

More Execs Using PCs

■ In a survey of the leading executives (vice-presidents and personnel directors) at 100 of the country's Fortune 1,000 corporations, Accountemps, a division of Robert Half International, reports that 39 percent of the people canvassed use a personal computer at home or in the office.

The Accountemps figure is in contrast to the nearly 22 percent of America's top 500 chief executive officers who reported they use a personal computer (either at home, in the office, or at both locations) in a survey conducted by *Personal Computing* for the special October 1986 issue entitled "Computing In America."

"It is surprising that executives, who know the value of computers, are failing to use them to boost their own productivity and in management planning and decision making," says Accountemps' vice-president, Marc Silbert. "It's partially a matter of perception, because I feel that an executive-caliber individual is never really more than two or three feet away from a PC."

"To tell you the truth, we were surprised that your [*Personal Computing's*] numbers were so low," Silbert says. "What I think we're seeing is the first wave of executives becoming acclimated to personal computers. When the second wave, the people currently in school, reach top management positions, they will bring along the familiarity with personal computers that they've gained on the school level."

Lifetree Fixes Bug

■ Lifetree Software has corrected the bug in its combination spreadsheet and word processing program, Words & Figures. The most prominent feature of the program is the ability to insert a spreadsheet into a word processing document. The bug in Words & Figures 1.0 appeared when the spreadsheet was inserted into the middle of text in a word processing document. An attempt to insert the spreadsheet into the middle of a sentence, or between two sentences, resulted in the program crashing. According to Lifetree's vice-president of marketing and sales, Wayne Wilson, it is unlikely that this situation would occur. Nonetheless, Lifetree has corrected the bug in release 1.01, which began shipping toward the end of 1986. The updated version also speeds up graphics capabilities.

GET SERIOUS

ASK ABOUT FREE
10MB Hardcard™ Option



...ABOUT ANALYZING YOUR DATA.

You might be spreading your spreadsheet a little too thin. Or maybe you're starting from scratch. But if you're serious about data analysis, you're ready for SPSS/PC+™ — a full software family that brings you six high-powered ways to complete any data analysis task.

Enter it. SPSS/PC+ Data Entry™ takes the effort out of entering and correcting data.

Analyze it. The SPSS/PC+ Base Package provides a powerful array of statistical and reporting procedures.

Examine it. SPSS/PC+ Advanced Statistics™ lets you get more serious with your data.

Table it. SPSS/PC+ Tables™ produces presentation-ready tables instantly.

Chart it. SPSS/PC+ Graphics™ featuring Microsoft® Chart creates show-stopping graphs and charts.

Map it. SPSS/PC+ Mapping™ featuring MAP-MASTER™ — our latest option — creates maps where vast amounts of data can be summarized and presented in one, simple picture.

SPSS/PC+ products are being put to productive use by serious fact finders in business, government and education. For countless purposes such as market research. Wage and salary studies. Survey analysis. And quality control. Plus each product is superbly documented and supported by SPSS Inc., a leader in statistical software for nearly 20 years. While specially tailored customer support is available through the VALUE PLUS™ plan.

So if you're serious about data analysis, step up to SPSS/PC+. For details, contact our Marketing Department.

CALL 1/312/329-3640

SPSS inc.

SPSS Inc. • 444 North Michigan Avenue, Suite 3000 • Chicago, Illinois 60611

In Europe: SPSS Europe B.V. • P.O. Box 115 • 4200 AC Gorinchem, The Netherlands • Telephone: +31183036711 • TWX: 21019

SPSS/PC+ runs on IBM PC/XT/AT's with hard disk. Contact SPSS Inc. for compatible microcomputers. SPSS/PC+, SPSS/PC+ Data Entry, SPSS/PC+ Advanced Statistics, SPSS/PC+ Tables, SPSS/PC+ Graphics and SPSS/PC+ Mapping are trademarks of SPSS Inc. for its proprietary computer software. VALUE PLUS is a trademark of SPSS Inc. Chart and Microsoft are trademarks of Microsoft Corporation. MAP-MASTER is a trademark of Ashton-Tate. Hardcard is a trademark of Plus Development Corporation.

© 1987, SPSS Inc.

(For More Information Circle 80)

UPDATE

IBM On The Offensive

■ Buffeted by intense competition for sales that has drawn the attention of the computer-buying public, IBM sent a Christmastime message saying that the company has revamped its public relations department to facilitate reporters' access to press information sources at IBM's Armonk, N.Y., headquarters. As part of its renewed effort, IBM has split press assignments so that some representatives will handle personal computers while others will cover larger systems. Within these larger divisions, the company has assigned representatives to certain areas such as desktop publishing, printers, CAD/CAM (computer-aided design/manufacturing), and manufacturing systems.

According to Michael Starks, IBM's information systems representative, the move by Big Blue is a result of strong competition in the marketplace, most notably from clone makers and computer manufacturers of large systems, such as the Digital Equipment Corp. Starks noted that IBM, in recognizing that "it's a different world out there" now, was "taking the offensive" in press relations. Perhaps the strongest evidence of IBM's new commitment to easier press access was an extensive press packet of suitable IBM contacts and their "beat assignments," complemented by prepunched Rolodex cards listing company contacts.

Hardware Update...

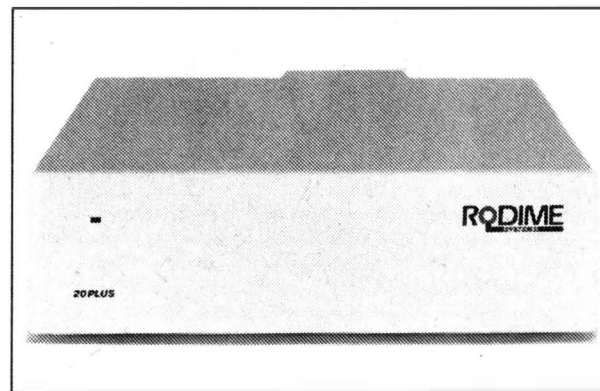
■ Datavue Technical Systems of Norcross, Ga., has enhanced its Series 30 line of personal computer systems to include the Advanced System Self-Check Diagnostics, and the Enhanced I/O and Memory Expander option, a daughterboard for the 8612 CPU (\$239) ...**Panasonic Industrial Company's Computer Products Division**, Secaucus, N.J., has upgraded its Business Partner series with a computer-to-FAX communications board and hard disk capability. An add-on card available from the company (\$1,000) enables the reception of any documents sent by a Group 3 facsimile machine, either domestically or internationally. In addition, the company has reduced the price of the Business Partner 286 model FX-800 from \$2,995 to \$2,249; model FX-800FI from \$2,795 to \$2,099; model FX-600 and model FX-600FI from \$1,495 to \$1,249 and \$1,255 to \$1,099, respectively...Panasonic has also upgraded its Personal Partner hand-held computer to include two options: a 300/1200-bits-per-second (bps) Hayes-compatible modem

(\$330), and an RS-232C serial port board (\$160)...**Hewlett-Packard Co.**, of Palo Alto, Calif., has introduced the new Hewlett-Packard Expanded Memory Board that has 512k (\$695) for the HP Touchscreen Personal Computer... HP has also released a rack-mountable version of its AT-compatible Vectra computer, the Vectra Industrial PC (\$6,225), for use in harsh manufacturing environments.

Hattori Seiko's MP-5300AI printer.

Kentek Information Systems, Allendale, N.J., announced an enhanced version of its K-2 page printer, the K-2/300 (\$7,995). Its controller has gate array technology that produces faster bit mapping...**EVI/Fastcomm Data Corp.** has added a 19.2k-bps

Turbo model to its line of dial-up Fastcomm "All Speeds in One" modems. This adds error-free 19.2k-bps capability to a Fastcomm 2400- or 9600-bps modem, increasing data throughput by 60 percent. Prices range from \$999 to \$1,099, and current users can upgrade to a Turbo for \$100...**Microcom, Inc.**, Norwood, Mass., has added new network management capabilities to its line of error-correcting dial-up modems with the Intelligent Network Controller for its High Density Modem System. The Controller's prices start at \$1,499...**Penril DataComm**, Gaithersburg, Md., has incorporated 21 new features into its Datalink 4800 (\$1,295), 9600 (\$1,795), and 9600 Fast Train (\$1,995) modems...A version of the Dots-Perfect enhancement kit (\$79.95) for Epson MX, IBM PC, and IBM Graphics printers has been introduced by **Dresselhaus Computer Products**, Glendora, California. The product offers a near-letter-quality (NLQ) mode as an improvement over the standard draft mode...**Hattori Seiko Computer Peripherals**, Mahwah, N.J., has announced a wide-carriage version of the



Rodime's 20 Plus SCSI hard disk.

MP-1300AI dot matrix printer, the MP-5300AI (\$899). It prints at 300 characters per second (cps) and includes a cartridge ribbon that has a 12-million-character life expectancy.

SoftStyle, Inc., Honolulu, Hawaii, is now marketing a new version of Microsoft's MacEnhancer expansion system (\$245) for the Macintosh that functions as an intelligent data switch that expands a single Mac port into four ports. It now includes SoftStyle's driver software, enabling the Mac to connect to a wider variety of printers and other devices, and eliminating the need for extra driver software, cable reconections, serial-to-parallel converters, and modifications to the user's application software...**Rodime, Inc.**, Boca Raton, Fla., has released the Rodime 20 Plus (\$1,295) and 45 Plus (\$1,695) external hard disk drives for the Macintosh Plus. The drives use the computer's high-speed small computer system interface (SCSI) connector port, making them up to six times faster than hard drives that use the external floppy port...A 30-port version of the NetCommander intelligent data exchange from **Digital Products, Inc.**, Watertown, Mass., nearly doubles the number of ports offered by the earlier 16-port version. The sub-LAN NetCommander 30 is priced at \$3,895 for the 32k version and \$5,495 for the 500k version.

...Software Update

■ **Spellswell** version 1.3 for the Macintosh (\$74.95), from Greene, Johnson, Inc., Monterey, Calif., now handles spelling errors in documents created with Microsoft Works, Lotus' Jazz, and Living Videotext's More. New features include a 93,000-word dictionary, expanded proofreading capabilities, and shortcut option settings. Customers can upgrade for \$15; free upgrades are available to customers who bought the program after last October 1...**Quinsept Inc.**, Lexington, Mass., has released version 3 of **Family Roots** (\$185). Features of the program include nine additional user fields and additional space for marriages, children, and notes. Owners of previous versions can upgrade for \$39...**Pecan Software Systems, Inc.**, Brooklyn, N.Y., has acquired the rights to **Jack2** (\$99.95), an integrated package featuring word processing, graphics, data base, and spreadsheet modules. Pecan is selling Jack2 for \$49.95 for a limited

101 MACROS for Lotus 123TM and 101 MACROS for SYMPHONY[®]

Instead of This...

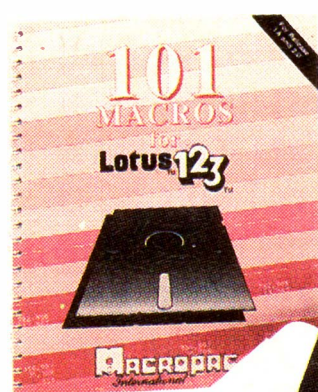


MAKE LOTUS EASIER — AND MORE POWERFUL

Now you can have your own on-disk library of shortcuts, utilities and keystroke savers that will work with ANY Symphony or 1-2-3 worksheet (all versions). No more dull, repetitive operations, no more wading through multiple menu steps, no more hours wasted with manual input that could be automated.

Introducing the ultimate collection of 101 pre-typed, ready-to-use, all purpose macros on disk. Imagine being able to:

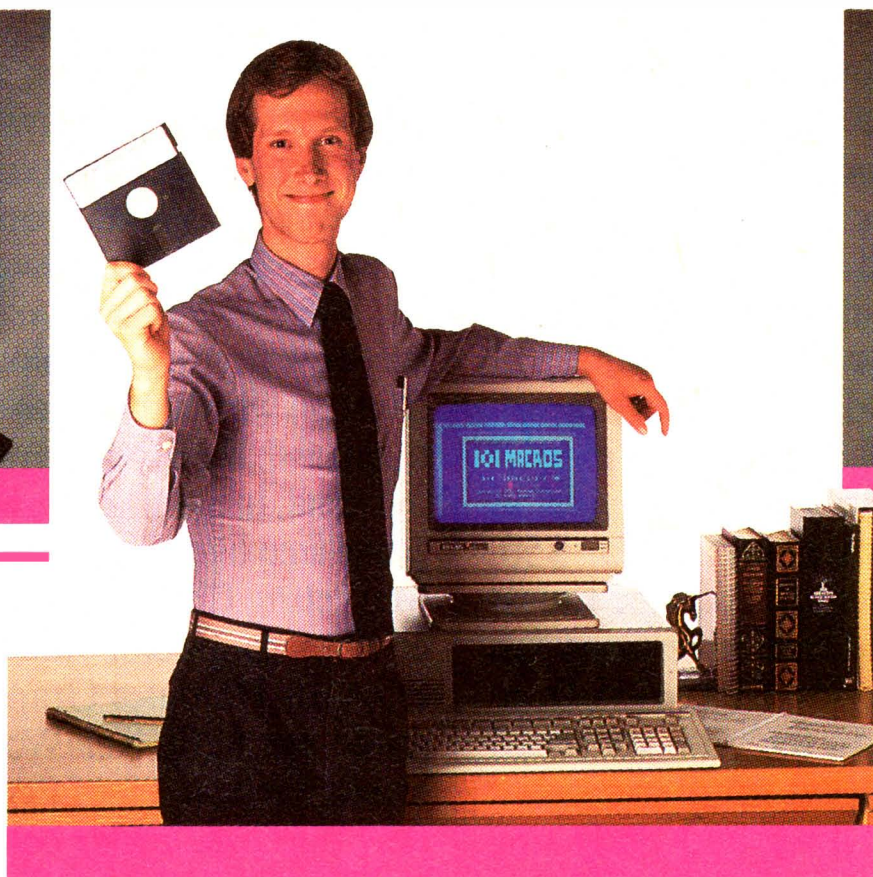
- Add word processing features to Lotus 1-2-3, including word-wrap
- Double-space your 1-2-3 printout, or print in super-tiny elite type
- Create special graphics and slideshow presentations
- Add a pop-up notepad, calculator and appointment calendar to your files
- Address form letters and print labels automatically
- Add menu-driven financial formulas and math functions



— Plus 95 more features to save time and multiply the power of Lotus 1-2-3.

INCREASE YOUR EFFICIENCY WITH 101 MACROS FOR LOTUS 1-2-3

You can save keystrokes, save menu steps, save time and automate your spreadsheet. Speed data entry with any one of three special Data Entry macros. Whip through complicated menus with a single keystroke, or set up your own custom menus. Eliminate repetitive operations with macros that will move down columns or across rows, changing each cell to your specifications.



With This. \$69.95

AND NOW INTRODUCING 101 MACROS FOR SYMPHONY



— All of the most popular macros from 101 MACROS FOR LOTUS 1-2-3, plus:

- Macros to automate the building of custom-made forms
- Gantt-like project management scheduling
- Automatic bold and italic type, page breaks and margins in Symphony's sheet mode
- Insertion of subtotal lines and instant subtotal calculations
- Recalculation of the spreadsheet by range

EASY TO USE

These macros are extremely easy to transfer to your own spreadsheet—and our User's Manual has made it even easier. Just a few keystrokes using File Combine is all it takes to transfer any of the macros from our handy on-disk collection to your own spreadsheets. And for the Symphony users, putting the macros in your Macro Library will make them even handier.

(For More Information Circle 8)

You Can Do This...



FREE! EXTRA BONUS FILES

Act now. For a limited time you get not only a complete collection of 101 macros with User's Manual, you will also receive an extra collection of 22 macros designed to help you type your own macros, a blank memo template with word-wrap and fancy printout, and a collection of Often Overlooked Tips for Lotus Users.

"A simplified way to access 123's and Symphony's most powerful functions."

—PC Week, 10/86

"A 123-taming arsenal... become a macro maven instantly."

—PC Magazine, 12/86

"One of the best ways to learn more about 123 and macros that I have seen."

—Computer Currents, 8/86

"Excellent... more than just a convenience tool... an enhancement for Lotus 123."

—Microtimes, 3/86

NOT COPY PROTECTED 60-DAY MONEY BACK GUARANTEE

*1-2-3 and Symphony are registered trademarks of the Lotus Development Corp.

101 MACROS

YES! I want 101 shortcuts, utilities and keystroke savers!

___ copies of 101 Macros for Lotus 1-2-3 @ \$69.95.

___ copies of 101 Macros for Symphony @ \$69.95.

___ Shipping (\$2.50 in USA, \$12.50 outside USA)

___ CA residents add \$4.90 tax for each product.

I enclose _____

—or— charge my ☐ VISA or ☐ MasterCard

Credit Card Exp. Date _____ / _____

Card # _____

☐ IBM-PC or compatible ☐ DEC ☐ HP150

Name _____

Phone _____

Company _____

Address _____

City _____ State _____ ZIP _____

MACROPAC
INTERNATIONAL

19855 Stevens Creek Blvd., Suite 168 • Cupertino, CA 95014

or Call with your VISA or MASTER CARD

1-800-227-2400, x945

UPDATE

time...Software Products International, San Diego, Calif., has announced that its **Open Access II Data Base and Spreadsheet** modules (\$395 and \$295, respectively) are now available individually.

Quarterdeck Office Systems, Santa Monica, Calif., and PC Designs Inc., Tulsa, Okla., have announced that it will bundle **Desqview** version 1.3 with the Grand Vitesse line of PC Designs computers...**PC MacBridge/Plus** version 3.0 (\$650), from Tangent Technologies, Norcross, Ga., now features an enhanced user interface, including pull-down menus; a LaserScript/Plus PostScript conversion program including pen plotter emulation; direct print options; direct support for all PostScript applications; and support for Microsoft Windows and Hayes' InterBridge. Customers who purchased version 2.00 through 2.16 after last August 1 can upgrade for \$50. Those who purchased version 2.00 through 2.16 prior to last August 1 can upgrade for \$75. Owners of earlier versions can update for \$100...**Turbo Maccountant** version 2.0 (\$495), from Digital Etc., Inc., Santa Monica, Calif., now includes advanced payroll functions, flexible budgeting, support for user-defined or preconfigured federal and state tax tables, and budgeting that enables income statements to be prepared three different ways. Customers can upgrade for \$95...The Dest Corp., Milpitas, Calif., announced that it will ship Silicon Beach Software's **SuperPaint**, a full-screen graphics and image editing program for the Macintosh Plus, as part of Dest's **Publish Pac** scanner software (\$595)...Productivity Software International, Inc., New York, N.Y., has reduced the price of **PRD+**, a keyboard/macro enhancement program designed to increase typing/data entry speed, from \$195 to \$68.

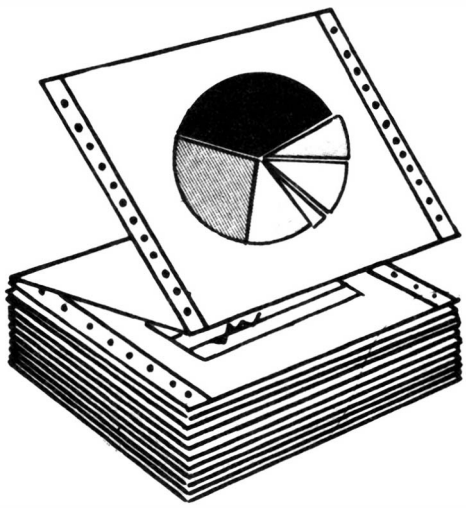
Visible Systems Corp., Concord, Mass., has released version 2.2 of **Visible Analyst Workbench** (\$1,785). Features of the new release include the ability to build a common data dictionary, move blocks, store a moved block as a construct, and support larger page sizes. An optional easel mode allows for a page size of 15 inches by 11 inches. Customers can update for \$150...RG Software Systems, Inc., Fort Washington, Pa., has removed all copy protection from version 4.0 of **PC Tracker** (\$495)...**Pro-Search** version 1.04 (\$495), from Personal Bibliographic Software, Inc., Ann Arbor, Mich., now supports the new two-step log-on procedure required for Dialog users. Also, copy protection has been removed. Revisions cost \$45 for Pro-Search owners, but are free to subscribers of the Pro-Search category-disk subscription service...Lattice, Inc., Glen Ellyn, Ill., has released version 3.10 of the **Lattice AmigaDOS C Compiler**, bundled with Lattice's Text Management Utilities for \$225; or the Professional Compiler, which includes the compiler, Text Management Utilities, Lattice Make Utility, Lattice Screen Editor, and the Metadigm MetaScope Debugger, for \$375. The new version features increased library modularity and new addressing modes that help reduce load module sizes by 20 percent. The new release also features faster pointer and integer math, direct support of the Amiga's FFP format library, and multitasking support. An upgrade is available to the Lattice AmigaDOS C Compiler for \$75 or to the Professional AmigaDOS C Compiler for \$225.

Hayes Microcomputer Products, Inc., Norcross, Ga., recently announced that its warranty program has been expanded to cover the performance of all Hayes software and hardware products. Any Hayes product purchased on or after last October 1 will be covered by the new warranty...Reality Technologies, Philadelphia, Pa., has announced a new price, \$69.95, for its business simulation software. **Business Simulator...The Tax Planner Template** (\$250), from Taxcalc Software, Inc., Fort

Worth, Texas, now incorporates the changes of the recent Tax Reform Act of 1986. The template includes all tax law changes for 1986, 1987, and 1988. Current owners of the Tax Planner may upgrade for \$150.

Hercules Computer Technology, Berkeley, Calif., has announced that the following eight software programs support the new Hercules Graphics Card Plus: **Manuscript, Nota Bene, Multi-Lingual Word Processing, Technical Scientific Word Processing, PS, SST, Flowcharting II+**, and **Language Design Kit...Primavision** version 1.07 (\$1,500), a plotter graphics package, now permits the plotting of the original target plan as a bar chart on which triangles denote the scheduled finish date or actual finish date for each activity. It is available from Primavera Systems, Inc., Bala Cynwyd, Pa. Customers will receive the upgrade free of charge...**Show Partner** version 2.0 (\$79) from The Marketing Channel, Ltd., Syracuse, N.Y., now runs any CGA or EGA four-color show on any computer system with CGA, EGA, or Hercules Graphics capability. Current users can upgrade for \$30...**RealWorld** Corp., Chichester, N.H., has released version 4.0 of **RealWorld** (\$695), which now includes a new purchase order component. Other enhancements to the program include: multicompany capability, on-line help, and an audit trail capability. Customers are able to upgrade for \$150...**Bluestreak Plus** version 2.0 (\$89.95), from Lang-Allan, Inc., Winter Park, Fla., now features keyboard mapping for up to 32 characters, and file transfer utilities. The package also offers a selection of terminal emulations (13 systems in all) and can be modified to emulate more. There is no charge for upgrades...Alpha Software, Burlington, Mass., has announced a new site-licensing plan available from retailers and value-added resellers. Under the plan, customers will be able to make unlimited copies of **Alpha/three**, a menu-driven data base manager that reads and writes dBase files...**Encore** version 3.1 (\$475) from Ferox Microsystems, Inc., Arlington, Va., now features screen data entry, a Lotus 1-2-3 release 2 interface, a CSV (Comma Separated Value) format for ASCII files, and a tax depreciation table. Customers who purchased Encore after last July 1 and those who have a maintenance contract will receive the new version free.

Irwin Magnetics, Ann Arbor, Mich., has introduced a utility program for its Backup-brand tape drives. **EzTape** features displays that are designed to speed and simplify protecting data stored on hard disks. The program is now included with all Backup tape drives and will be available to current users of Backup for \$74.95...**S.O.S.** (\$49.95), from Goldata Computer Services, Inc., Bryn Mawr, Pa., a utility that saves Lotus 1-2-3 (releases 1A and 2.0) and SuperCalc 4 spreadsheets in RAM to disk, has been adapted to work with MultiMate...Best Programs, Alexandria, Va., announced that the **PC/TaxCut Tax Planner**, which is usually published as part of the PC/TaxCut Tax Preparation Program (\$145), is available this year as a stand-alone program. The program has been revised in keeping with the Tax Reform Act of 1986 and retails for \$15...SoftStyle, Inc., Honolulu, Hawaii, has released version 2.5 of the **Start Products** (Epstart, Epson printers; Jetstart, HP ThinkJet and QuietJet; Laserstart, HP LaserJet series; TI-start, TI 855/865 and 850/860XL printers; and Toshstart, Toshiba printers) (\$45 to \$95). The new version is now compatible with the Macintosh Plus, Macintosh 512k Enhanced, and version 5.3 of the Finder. New features include improved word spacing and tabbing in text mode, faster printing speeds, and four new fonts (pica, elite, compressed, and proportional). Upgrades to version 2.5 are currently available for \$15 to registered owners of the program. ■



Graph-In-the-BoxTM

MEMORY RESIDENT

Add Instant Graphs to Virtually Every Application You Own!

Save \$10.00 when you buy Graph-In-the-Box with this coupon.

Now you can add instant graphs to every application you own. Quickly, and easily, because Graph-in-the-Box is memory-resident. No matter what application you're running, if there are numbers on the screen, Graph-in-the-Box will capture those numbers directly off your screen and show them to you as a graph. Instantly. See eleven different graphs of those numbers in just seconds—and save, or print the graph in just seconds—before you return to your original application.

This is the instant-graph program that the press is raving about. One low price lets you add

instant graphs to every application you own. It's great for applications that don't have any graphics, and it's great for applications where graphs are more than a keystroke away.

Graph-in-the-Box supports more than 90 leading printers and plotters and their compatibles, but even if you never print a graph, you can benefit from instant graphs, because they give you instant insight, instant analysis of your data. Graphs made instantly from numbers that appear on your screen, no matter what application you're running.

Three Ways to Save Ten Dollars With This Coupon:



**Serious business graphics
as simple as child's play.**

- Order by Mail with this coupon, with our 30-day Money-Back Guarantee.
- Order by Phone Toll Free—call 800-633-2252 and ask for Extension 7008, and get our 30-day Money-Back Guarantee.
- Buy Graph-in-the-Box from your local Software Dealer. Then send us this coupon with proof-of-purchase when you send us your registration card, and we'll send you \$10.

Please send me _____ copies of Graph-in-the-Box Version 1.2 immediately.

_____ \$137.60 Not Copy Protected _____ \$ 87.60 Copy Protected

(Upgrade to not-copy-protected available for \$50.00)

Name _____

Company Name _____

Address _____

City _____ State _____

Zip _____

Tel. _____

Enclosed \$ _____ Payment VISA MC Check

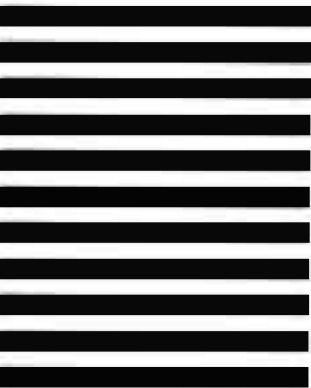
Card Exp. Date _____ Card No. _____

Add \$5.00 for shipping and handling (CT resident add 7.5% Sales Tax).

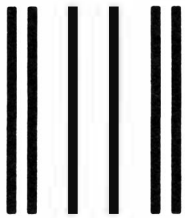
Offer Expires June 30, 1987. This offer not valid in combination with other manufacturers' promotions.

NEW ENGLAND SOFTWARE GREENWICH OFFICE PARK 3, GREENWICH, CT 06831

TAPE CLOSED AND MAIL



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES



BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 1318 STAMFORD, CT

POSTAGE WILL BE PAID BY ADDRESSEE

NEW ENGLAND SOFTWARE
Greenwich Office Park #3
Greenwich, Connecticut 06830-9990

The Critics Rave!

“It deserves to have its name rung from the bell towers.”
—**THE BYTE BUYER**, August 1986

“The dream can become a reality with Graph-in-the-Box.”
—**PC PRODUCTS MAGAZINE**, September 1986

“Pops up on demand from the memory of your PC to grab any numbers in sight and convert them into graphics for on-screen or hard copy display.”
—**PC WEEK**, April 1986

“Does what it is designed to do very well, is simple to learn, fast and easy to use.”
—**COMPUTER DEALER**, July 1986

“This is a no-nonsense program that transforms data displayed by any program, memory-resident utilities included, into a compelling repertoire of business graphs.”
—**PC WORLD**, September 1986

Graph-in-the-Box is a serious business tool ... But watch out—the program is so much fun to work with that you might start graphing every set of numbers in sight.”
—**PERSONAL COMPUTING**, July 1986

“One of the neatest ideas I’ve seen for a memory-resident program—presentation graphics, right at your fingertips.”
—**INFOWORLD**, April 1986

HOW FAST CAN SOMETHING CHANGE THE WAY YOU THINK?



1947 INSTANT PHOTOGRAPHS

"All this seems so simple that, as usual, we wonder why it was not done before . . . There is nothing like this in the history of photography."

THE NEW YORK TIMES

1986 INSTANT GRAPHS™

"... One of the neatest ideas I've seen . . . presentation graphics right at your fingertips."

Michael J. Miller INFOWORLD

"If you need a visual look at your data *right now*, Graph-in-the-Box will fulfill your most impatient desires . . . amazingly well."

Winn L. Rosch, PC MAGAZINE

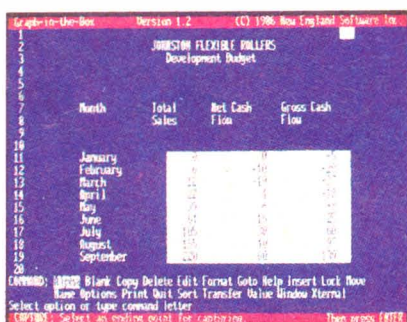
Make graphs instantly in every application you own: Lotus® 1-2-3®, Multiplan®, dBase®, and WordStar® are just a few.

HOW INSTANT GRAPHS WORK:

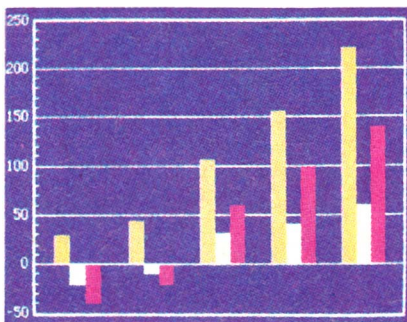
Now with revolutionary Graph-in-the-Box, you can make graphs, in an instant, in your spreadsheets, databases, word processors, or programming languages. Anywhere there are numbers!

Graph-in-the-Box makes graphs instantly, from data that appear on your screen—while you're still running your original program.

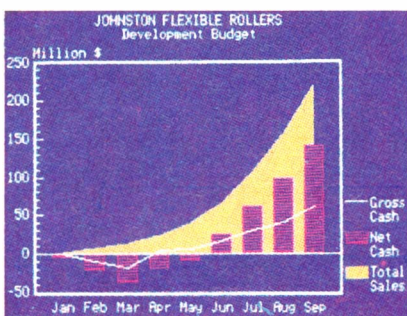
Look how easily and quickly Graph-in-the-Box makes instant graphs in all your programs.



Twokeys wake up Graph-in-the-Box during any application. Pass the cursor over any numbers . . .



and press ENTER to see them as a simple graph.



Now pass the cursor over any text—and choose one of eleven different finished graphs to display or print, instantly.

HOW INSTANT GRAPHS HELP:

Instant graphs give instant insight and instant analysis to all the work you do. But don't take our word for it, listen to Personal Computing's rave review:

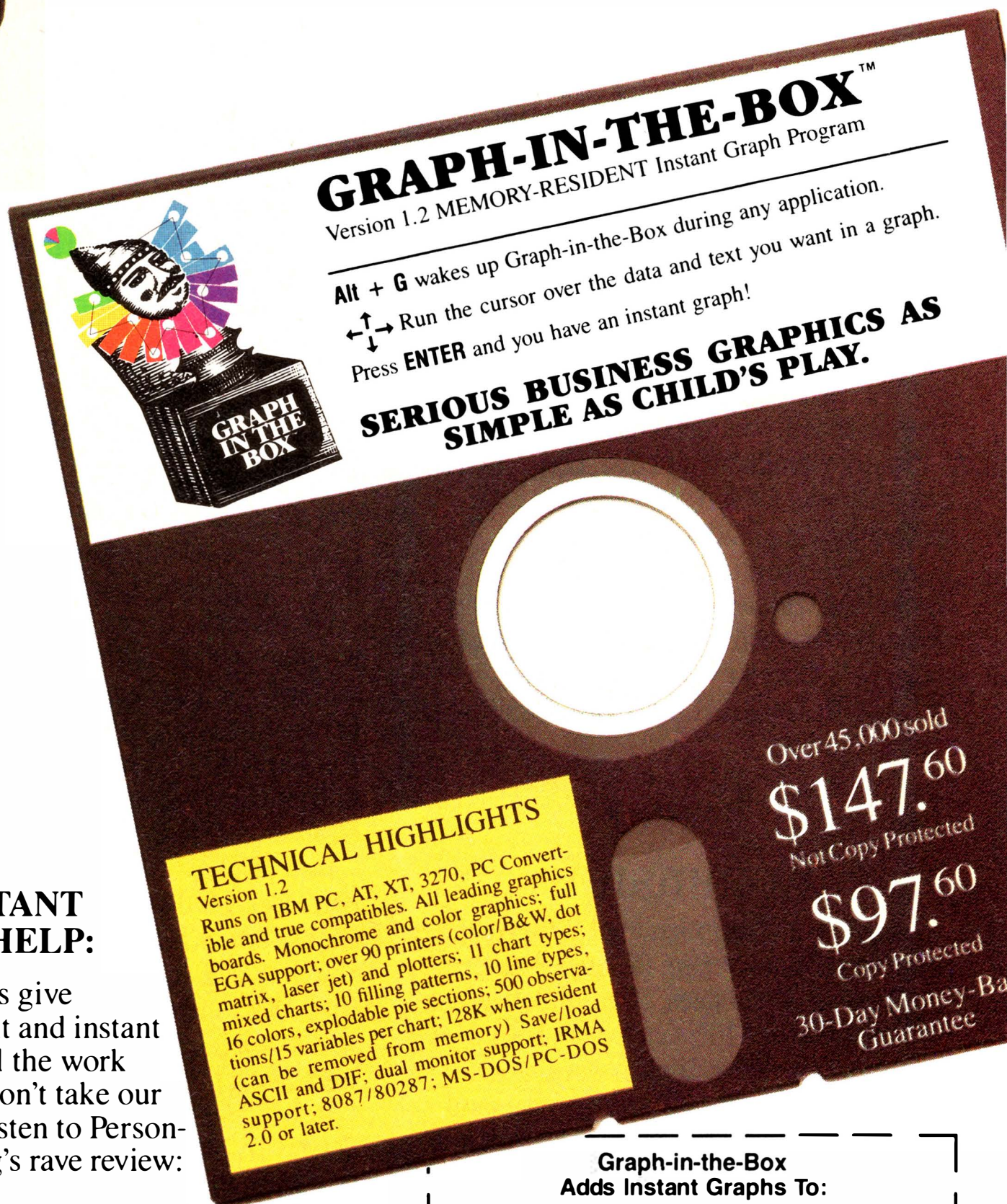
"Graph-in-the-Box is a serious business tool. With it, you can quickly turn a table of numbers into a graph, regardless of whether the numbers reside in a word processing file, spreadsheet, data base or any other application program. And you can save and print the graph—all without exiting your main application . . . But watch out—the program is so much fun to work with that you might start graphing every set of numbers in sight."

Michael Antonoff

GET YOUR COPY IN AN INSTANT:

Visit your local dealer and try Graph-in-the-Box with your favorite application. Or order direct from us and get our 30-Day Money-Back Guarantee. Call now:

800-633-2252, Ext. 7001.



TECHNICAL HIGHLIGHTS

Version 1.2
Runs on IBM PC, AT, XT, 3270, PC Convertible and true compatibles. All leading graphics boards. Monochrome and color graphics; full EGA support; over 90 printers (color/B&W, dot matrix, laser jet) and plotters; 11 chart types; mixed charts; 10 filling patterns; 10 line types; 16 colors, explodable pie sections; 500 observations/15 variables per chart; 128K when resident (can be removed from memory) Save/load ASCII and DIF; dual monitor support; IRMA support; 8087/80287; MS-DOS/PC-DOS 2.0 or later.

Over 45,000 sold
\$147.60
Not Copy Protected

\$97.60
Copy Protected

30-Day Money-Back Guarantee

Graph-in-the-Box Adds Instant Graphs To:

Spreadsheets, Databases, Word Processors, Communications Packages, Terminal Emulators, Accounting Packages, Statistical Analysis Packages, Utilities, Operating Systems, Memory-Resident Applications, Memory-Resident Utilities, etc. Here are just a few:

Partial List of Compatible Software

Multiplan, Lotus 1-2-3, dBase II, dBase III, WordStar, Word Perfect, Dataflex, R:Base 5000, SuperCalc, Report Manager, Paradox, Irma, Enable, Electric Desk, Open Access, Symphony, Microsoft Word, Pfs:file, Pfs:report, Pfs:write, Sidekick, Crosstalk, Easylink, Ethernet, Intellisoft, Microsoft Project, Norton Utilities, Samna, Ready!, Sideways, Turbo Pascal, Turbo Lightning, Graphing Assistant, Grafix Partner, Inset, DisplayWrite, Volkswriter, Multimate, Multimate Advantage, Writing Assistant, Microsoft Basic, Data Ease, Spotlight, ThinkTank, and many more.

NEW ENGLAND SOFTWARE

GREENWICH OFFICE PARK 3, GREENWICH, CT 06831

Lotus HAL Lets You Do More With (And Get More From) 1-2-3 Than Ever Before.

Lotus HAL™ is a memory resident companion product for Lotus 1-2-3® that enhances the full range of 1-2-3's capabilities—and adds new ones.

It increases 1-2-3's power and flexibility, so you can work more efficiently and become more productive than ever before.

Benefits For All 1-2-3 Users

Lotus HAL works by giving you easier access to all of 1-2-3's numerous capabilities. And it's extremely useful for 1-2-3 users of all levels.

If you're new to 1-2-3, Lotus HAL will let you use it with greater confidence and speed.

If you're familiar with 1-2-3, Lotus HAL will make it easier for you to access additional power and capabilities.

And if you're an advanced 1-2-3 user, Lotus HAL will show you new features and functions that will add extra flexibility to the power of 1-2-3 you've already tapped.

How does Lotus HAL do all this—for all users?

Easier Commands

Lotus HAL makes executing 1-2-3 procedures even easier than before. Because it accepts phrases like "total sales," "graph Jan to Mar," or "copy this to A10," etc. In fact, Lotus HAL's vocabulary includes English words and phrases. So you can customize a command dictionary of your own—with the words and operations you're most used to and most comfortable using.

Since Lotus HAL makes 1-2-3 more accessible for all users, you'll learn more—in less time—about all the capabilities of 1-2-3.

For instance, if you're presently using only the spreadsheet, Lotus HAL will show you how to create graphs and do database functions—far more simply than ever before.

Time-Saving Shortcuts, Easy-To-Creat Macros

With Lotus HAL, you'll take shortcuts and accomplish multi-step tasks quickly and easily. So you'll greatly reduce errors—and save time.

And, with a simple "undo" command, Lotus HAL even lets you recover from errors you've already made. So if you're a novice user, you'll learn faster and with greater confidence. And if you're an experienced user, you can experiment more freely and do "what ifs"—without fear of having a mistake destroy hours of work.

Lotus HAL also makes developing macros simpler than ever—so simple, in fact, that even novice users can create 1-2-3 macros with Lotus HAL. And no matter how familiar with 1-2-3 you are, you'll benefit from being able to write and test macros to make sure they do what you had in mind.

New Power

Lotus HAL will let you take 1-2-3 as far as you need. And if you've been taking it far already, Lotus HAL offers you new commands that will further enhance your productivity.

For example, Lotus HAL lets you replace items anywhere in the worksheet (even within formulas), and create a dynamic link between cells in multiple worksheets. It also lets you audit your worksheet—so you can find mistakes without having to review the entire sheet "manually."

Best of all, while Lotus HAL greatly enhances 1-2-3's commands, it doesn't change either 1-2-3 or the worksheet. It's always available, but it never gets in your way. And you can share data as freely when you're using Lotus HAL as you did when you were using 1-2-3 alone.

In fact, you can do everything you've ever done with 1-2-3 even better... plus a great deal more.

And since Lotus HAL is part of the 1-2-3 system—and the Lotus family—you get an unparalleled commitment to customer service and support that will keep you up and running.

© 1987 Lotus Development Corporation.
Lotus and 1-2-3 are registered trademarks of Lotus Development Corporation. Lotus HAL and 1-2-3 Companion are trademarks of Lotus Development Corporation.
Lotus HAL is distinguished from HAL, which is a trademark of Qantel for its Hotel and Leisure Software.

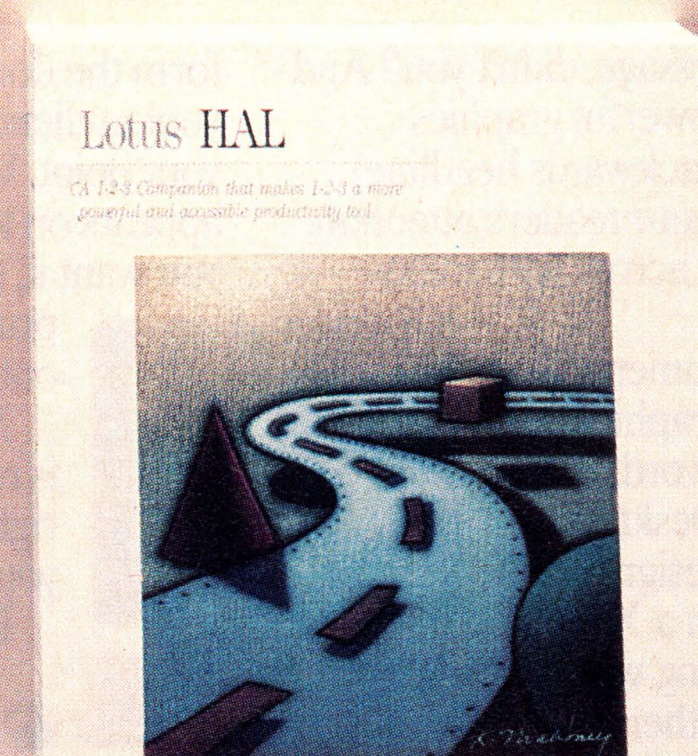
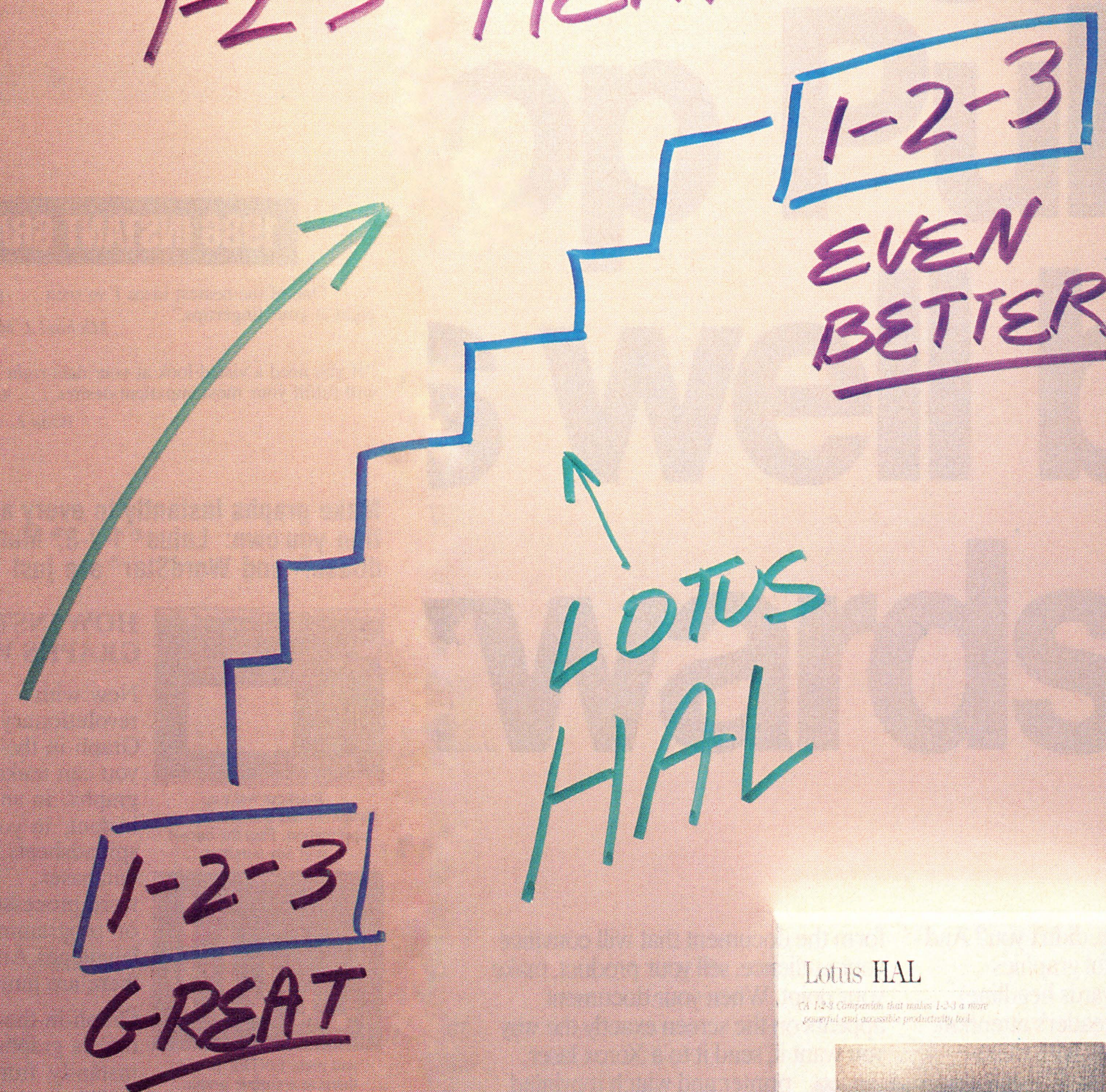
System Requirements.

Lotus HAL requires 1-2-3 Release 1A, Release 2 or Release 2.01 for personal computers from IBM*, COMPAQ, and AT&T, plus 1-2-3 Certified Compatibles; DOS 2.0 or higher. Please refer to your 1-2-3 package or 1-2-3 documentation for appropriate hardware configurations and DOS requirements or consult your dealer.

Lotus HAL resides in memory with 1-2-3 and operates with it; a minimum system configuration of 512K is required.

*Lotus HAL does not operate with 1-2-3 for the IBM PCjr (ROM version), IBM PC Convertible or Release 1A for the IBM 3270 PC.

THE STAIRWAY TO
1-2-3 HEAVEN



Make 1-2-3 even better... with Lotus HAL.

If you are among the two million people working with Lotus 1-2-3, you owe it to yourself to try Lotus HAL.

You'll save time... increase your productivity on 1-2-3... enjoy new functionality... unleash new power.

You'll see how easily you can execute 1-2-3 commands. And how the "undo command" can rescue you from serious errors you've already made.

And, you'll do so at a remarkably low price. Because Lotus HAL costs only \$150.

Visit your local authorized Lotus dealer or if you're already convinced, simply use the coupon below to order Lotus HAL directly from Lotus.

Or order Lotus HAL (Product No. GM-1377) by calling Lotus, toll free, at

1-800-345-1043.

Lotus HAL

A 1-2-3 Companion™ that makes 1-2-3 a more powerful and accessible productivity tool.

Complete and return to: Lotus Development Corporation, 90 Annex, Atlanta, Georgia, 30390-0370 or call 1-800-345-1043.

- ☐ Yes, I'd like to try Lotus HAL for 30 days without obligation. (GM-1377)
☐ Please send more information about Lotus HAL. (GM-1385)

Send me _____ unit(s) of HAL @ \$150 each _____

Sales Tax** _____

Total _____

☐ I've enclosed my check or money order made payable to: Lotus Development Corporation.

Please charge my: ☐ VISA ☐ MasterCard

Card No. _____

Expiration Date _____

Signature _____

Name _____

Company _____

Address _____

City _____ State _____ Zip _____

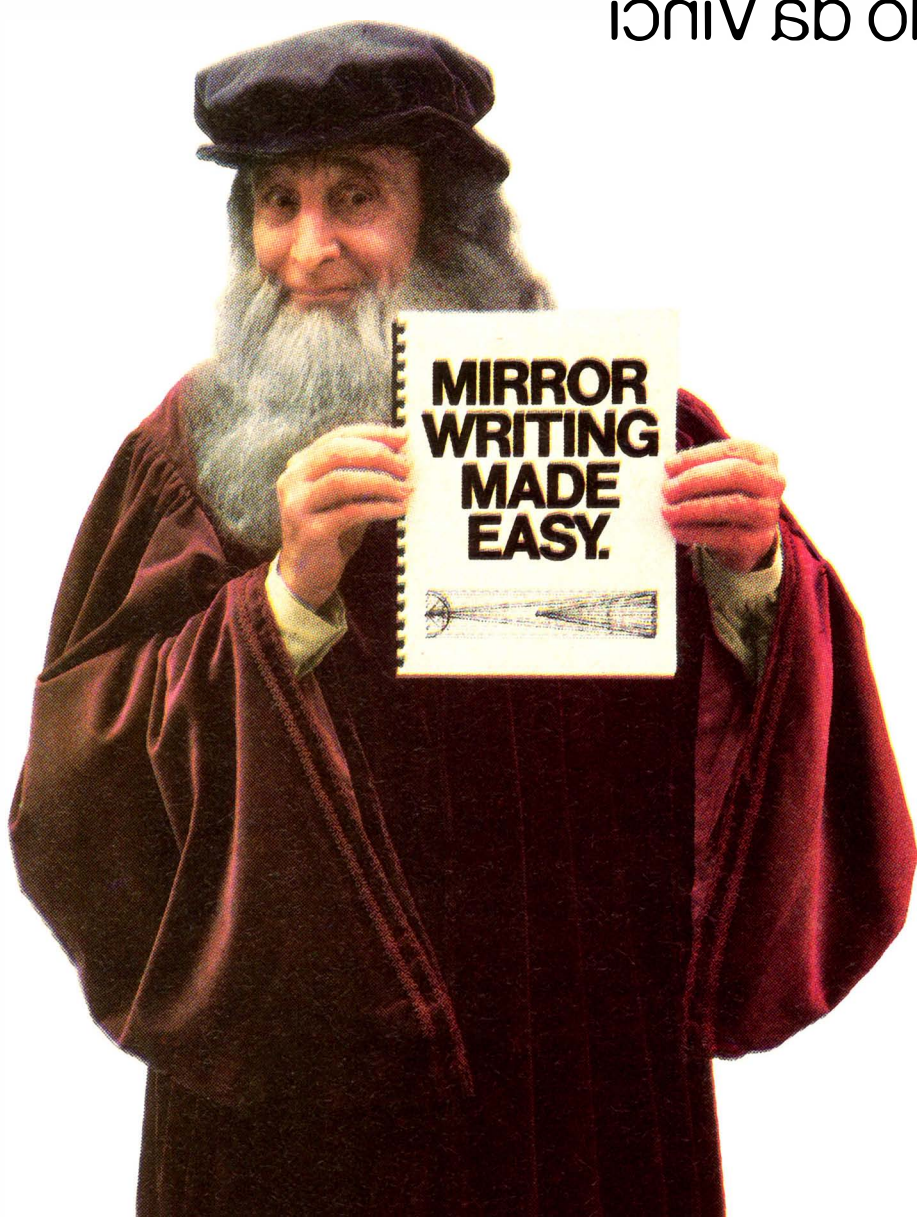
Phone (_____) _____

**Residents of the following states apply applicable sales tax: CA, DE, FL, GA, MA, MD, MI, MN, MO, NJ, NY, OH, TX, VA, WA. Offer good in U.S.A. and Canada only. In Canada make payment by credit card or International Postal Money Order. CODs and purchase orders will not be accepted.

When you purchase Lotus HAL directly from Lotus, take your first 30 days to try it out. If after 30 days Lotus HAL does not perform as described and you've purchased it directly from Lotus, we'll gladly give you a full refund.

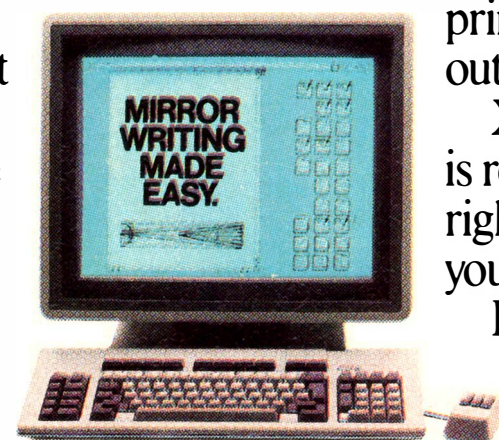
“You might as well be Xerox Desktop Publisher, if you’re not using a word processor.”

Leonardo da Vinci



You got our message, didn't you? And that's the point. Powerful graphics (such as our big backwards headline) not only capture your reader's attention, but get your ideas across with maximum impact.

Producing documents that combine telling graphics with compelling words is the genius of Xerox Desktop Publishing. You design your document on a Xerox workstation, putting words and graphics together to



form the document that will convince your audience, sell your product, make your point. When your document appears on the screen exactly the way you want it, send it to a Xerox laser printer and watch it printed out laser-perfect.

Xerox Desktop Publishing is ready to go to work for you right now. No matter what your particular needs.

If you need a system that can stand on its own or be connected to a

network, there's the Xerox Documenter. If you own an IBM PC XT/AT or compatible, then our Xerox Ventura Publisher Edition software is tailor-made for you. If you need an MS-DOS-based stand-alone, we'll set you up with a Xerox Desktop Publishing System.

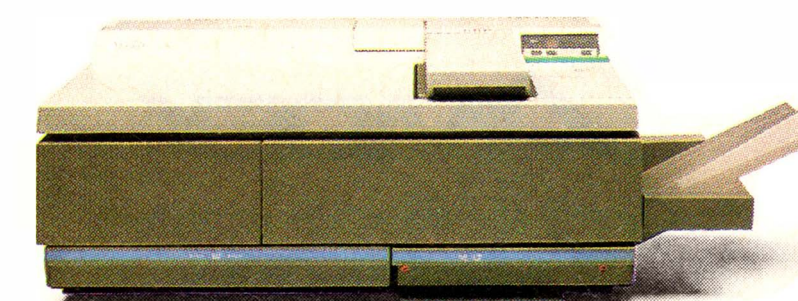


And when your needs expand, Xerox can grow with them, because our Desktop Publishing components are part of a migration path which can include local area networks as well as

(For More Information Circle 70)

a complete line of electronic publishing systems and laser printers. So, whether you're starting from scratch or adding to existing hardware, you can start creating documents that truly reflect the genius in you.

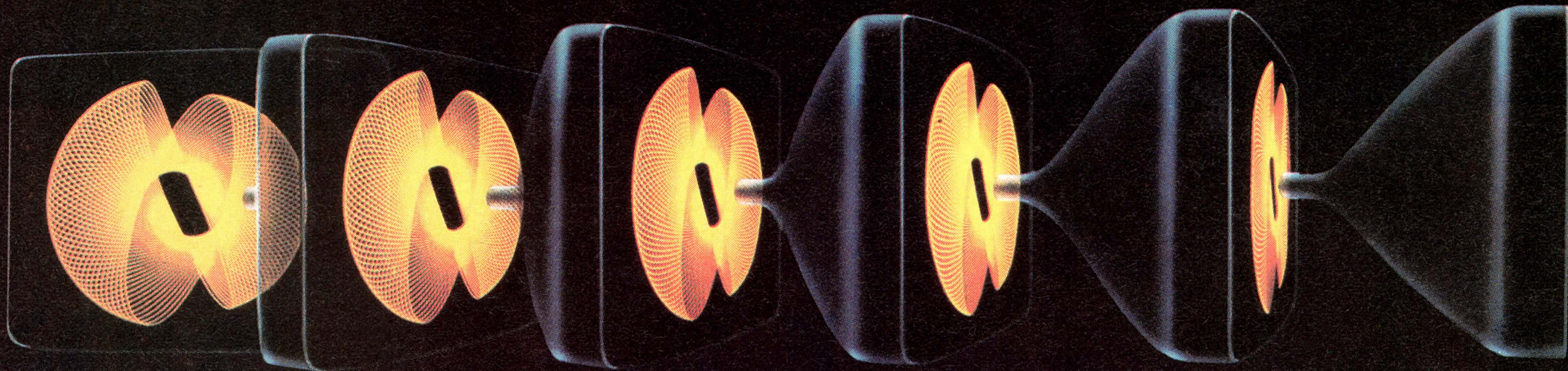
Xerox brings out the genius in you.



Xerox Corporation, P.O. Box 24, Rochester, NY 14692.
☐ Please have a sales representative contact me.
 Please send information on ☐ The Xerox Documenter.
☐ Xerox Ventura Publisher Software.
☐ Xerox Desktop Publishing System.

NAME (Please Print) _____
 COMPANY _____ TITLE _____
 ADDRESS _____ CITY _____
 STATE _____ ZIP _____ PHONE _____
 Or, if you can't wait, call
1-800-TEAM-XRX, ext. 170B
 (1-800-832-6979, ext. 170B). 316-3-87

XEROX® is a trademark of XEROX CORPORATION. VENTURA PUBLISHER® is a trademark of VENTURA SOFTWARE, INC. IBM® and PC XT/AT are trademarks of INTERNATIONAL BUSINESS MACHINES CORPORATION. MS-DOS® is a registered trademark of Microsoft Corporation.



Amdek's new flat screen monitor won't leave you flat broke.

The latest in monitor technology is the flat screen. And, naturally, one of the first manufacturers to use this technology is the leading independent supplier of monitors—Amdek.

Our new flat surface monitor features a 12" screen with dynamic focusing capabilities. And because Amdek doesn't cut corners, the 410 will provide you with consistent resolution from corner to corner. That means text will be crisp and clear no matter if it's displayed in the far upper right portion of the screen, or precisely in the middle.

What's more, depending on the software, the 410 can display up to 132 columns by 25 lines of text, giving you increased spreadsheet capability. Plus, you can choose a green, amber or white CRT—whichever is most pleasing to your eyes. A non-glare nylon mesh screen

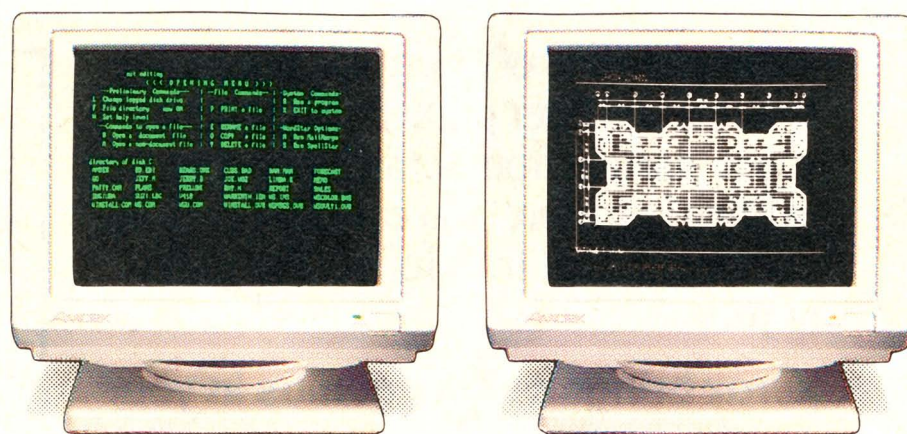
adds to easy-viewing, high-contrast display.

And the attractive

cabinet styling is aesthetically compatible with the IBM PC—and will actually complement any office setting. In addition, the unusually small footprint saves valuable desk space.

The Price? It won't leave you flat broke. Because the flat surface screen 410 costs less than IBM monitors. Plus Amdek's exceptional warranty makes sure that you won't be flat

out of luck. It's three full years on the CRT, and two years on all other parts and labor. Our flat surface screen 410 works perfectly with the IBM XT and AT personal computers, as well as their compatible clones. So, it's the ideal monitor for many business and educational applications. With its styling, features and price, the 410 is flatly the best bargain in monitors today.



AMDEK

Clearly the finest in monitors.

IBM is a registered trademark of International Business Machines Corp.

2201 Lively Blvd., Elk Grove Village, IL 60007, Phone: 312/364-1180

(For More Information Circle 1)



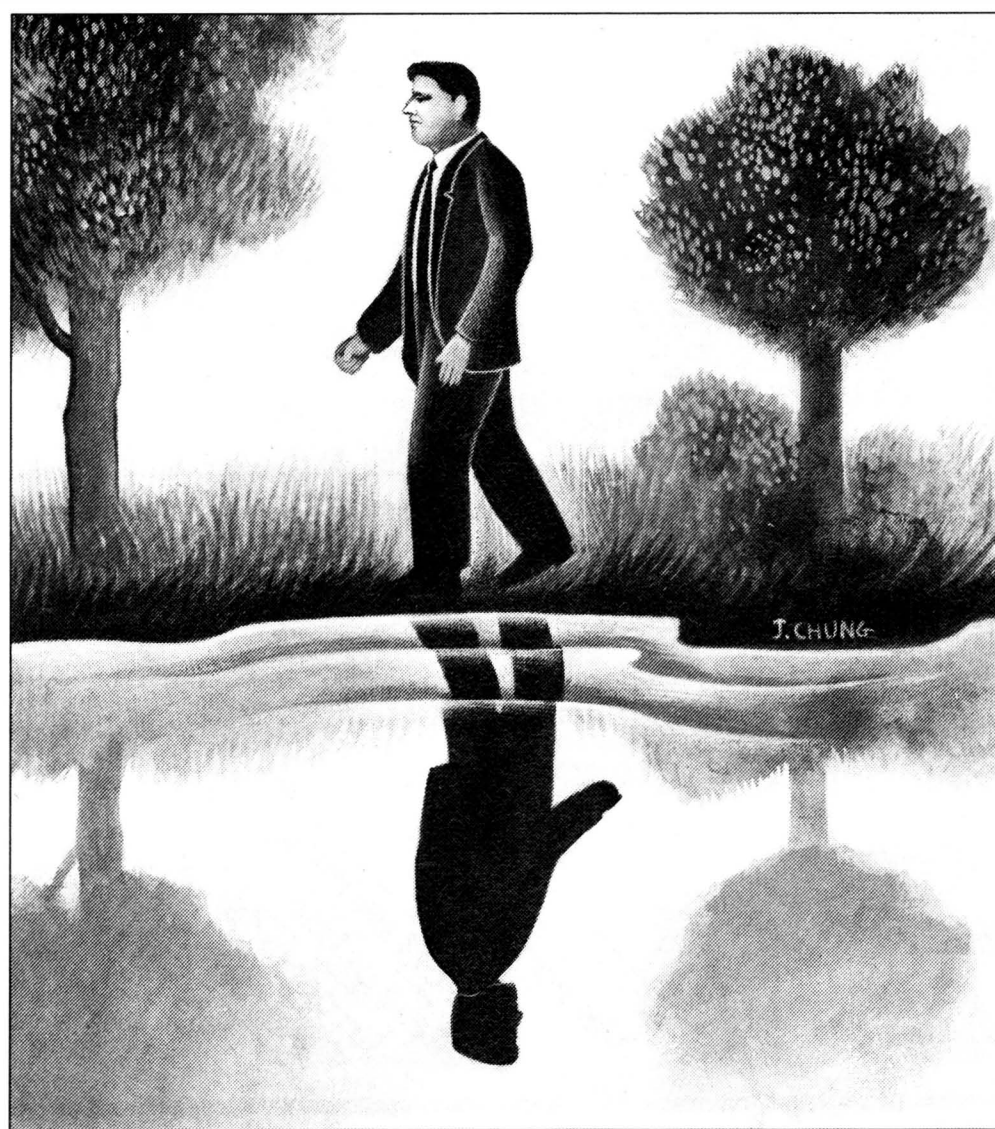
by Richard A. Shaffer

The Software Imitators

Adam Osborne was not the only one who thought that imitations of brandname software would sell better than they have. So did I. A year or so ago, most of us who make our living predicting the future of the industry expected that knockoffs of 1-2-3, dBase, or WordStar would have amounted to something by now. Why they haven't may help explain why I still believe they will and why two programs developed late last year—Words & Figures from Lifetree Software and 259 from Ontio Software—are worth paying attention to.

Over the last several months, one force behind the steadily rising prices of shares in Lotus Development Corp., Ashton-Tate, and Microsoft has been the spread of the inexpensive clone computers, whose buyers want industry-standard software. But why would anyone who is unwilling to spend more than \$1,000 for a computer spend that much or more for a couple of programs to run on it? How much longer will the leading software companies continue to benefit from the rise of hardware clones if price-conscious buyers can purchase reliable, trusted, well-distributed imitations?

The answer depends partly on the courts. The future of software clones is murky because it may be illegal not only to copy software but also to imitate its "look and feel." But if the legal issues are resolved, then those three adjectives—reliable, trusted, and well-distributed—become important. Lotus 1-2-3 has withstood imitators, in part, because the original was a world-class programming feat. Copies don't work as well. In addition to being not quite compatible, for example, Paperback Software's VP Planner is slower than 1-2-3 and likely to remain so because it is written in Forth instead of Assembler. Words & Figures, however, is a very good imitation of 1-2-3; I didn't notice the difference, except



that in some ways Words & Figures is better. Although I haven't tried 259, computer maven friends who have tell me it's highly compatible with 1-2-3 macros, keystrokes, and file structures. Because it is written in C, it does recalculate more slowly than 1-2-3. But at a low enough cost—the \$30 of Ontio's 259, for instance—people will try a software clone if reviews are favorable. Previous clones were too expensive.

Trust will take longer to build—long enough that clone makers will need low-overhead business strategies to survive, unless they can sell their imitations in bulk to other companies that already have distribution in place. In other industries, small companies often adopt such a private-label strategy and make, for instance, vacuum cleaners that are resold under the Sears label.

One reason that software imitators to date have fared poorly in comparison to their hardware counterparts is the inability of the distribution channel to profit from software of whatever sort. For instance, I'm certain that Businessland, which has difficulty enough profiting on a \$400 sale of 1-2-3, has no interest in a \$30 software package. Even if the gross profit were 100 percent of the

retail sales price, the profit in absolute dollars is too small to justify the time it takes to make the sale. Suppose, however, that Businessland could slightly modify Ontio to run on Businessland networks and resell copies 50 at a time under a \$2,000 site license. Thereby hangs a profit.

And in addition, Businessland would be helping Ontio surmount the trust barrier by putting its own good name on the product. Would such a move put Businessland into conflict with Lotus, whose 1-2-3 it carries? Not really. Those who buy clones are price-driven buyers who, by definition, weren't in the market for the expensive original. Businessland already resells Wyse's IBM-compatible personal computer under its own name, and yet it still carries IBM computers.

At \$30 suggested retail, the second- and third-tier makers of PC clones could afford to toss in copies of the software clones, bundling some applications with the system as Adam Osborne did so successfully in the early days of his portable Osborne computer. Similarly, retailers could afford to use the software as a traffic builder, advertising it at giveaway prices to get customers into the store. They could toss it in with the hardware for free to close a sale, assuring customers that because it runs like 1-2-3 they can always come back and buy the real thing without losing data or macros.

Mind you, I am still not convinced that software clones are the big deal I once took them for. But I have begun to see how small companies might be built around them, provided their expectations are modest enough.

If I'm right, software could begin to split along two paths, just as hardware has. Many buyers will continue to prefer the high road, purchasing original software to get the updates, warranty, manuals, add-ons, and other benefits. But other customers will take the low road, buying clone software for clone computers. ■

Richard A. Shaffer is the editor and publisher of the COMPUTER LETTER, a weekly industry newsletter.

TOP HONORS FOR GRAPHICS

**Software
Digest®**

**RATINGS
NEWSLETTER**

Vol. 3, No. 11 / November 1986

Bar, and line graphs. Speed tests
print and plot graphs. Quality tests

programs. The 1987 schedule will kick off with word processing
ages in January and project management software in February.

Software Digest Rating	Overall Evaluation	Program Name	Version Tested	Ease of Learning	Ease of Use	Error Handling	Performance	Versatility	Memory Requirement	Price	Volume Purchase Discounts	Site Licensing	Program Can Be Copied	Demo Disk Available	Page
★★★★★	8.6	Harvard Presentation Graphics	A.01	■	■	■	■	■	256K	\$395	✓	✓	✓		26
★★★★★	8.4	Chart-Master	6.2	■	■	■	■	■	192K	\$375	✓		✓		14
★★★★	7.6	GEM Graph	1.0	■	■	■	■	■	320K	\$249	✓	✓	✓		18
★★★★	7.4	Picture Perfect	3.4	■	■	■	■	■	384K	\$295	✓				36
★★★★	7.2	Microsoft Chart	2.0	■	■	■	■	■	256K	\$295	✓	✓	✓		28

Ratings Key

(On a scale of 0 to 10)

OVERALL EVALUATION

★★★★★ 9.0 or higher

★★★★ 8.0-8.9

★★★ 7.0-7.9

★★ 6.0-6.9

★ 5.0-5.9

ALL OTHERS 0.0-4.9

Lots of experts are putting Harvard Presentation Graphics (HPG) at the head of the class. Software Digest gives HPG their highest rating ever for a business graphics package — a rating won for superior performance, combining quality output and fast creation of graphics.

PC Magazine names HPG a “superb choice” because it’s “flexible, fast, easy to use and well thought-

out.” They rank HPG as a “first-rate graphics package.”

Infoworld calls Harvard Presentation Graphics “an elegant and intuitive program,” that is also “powerful and versatile.”

And, according to PC Week, “the real key to a presentation graphics package is output, and this is where HPG really shines.”

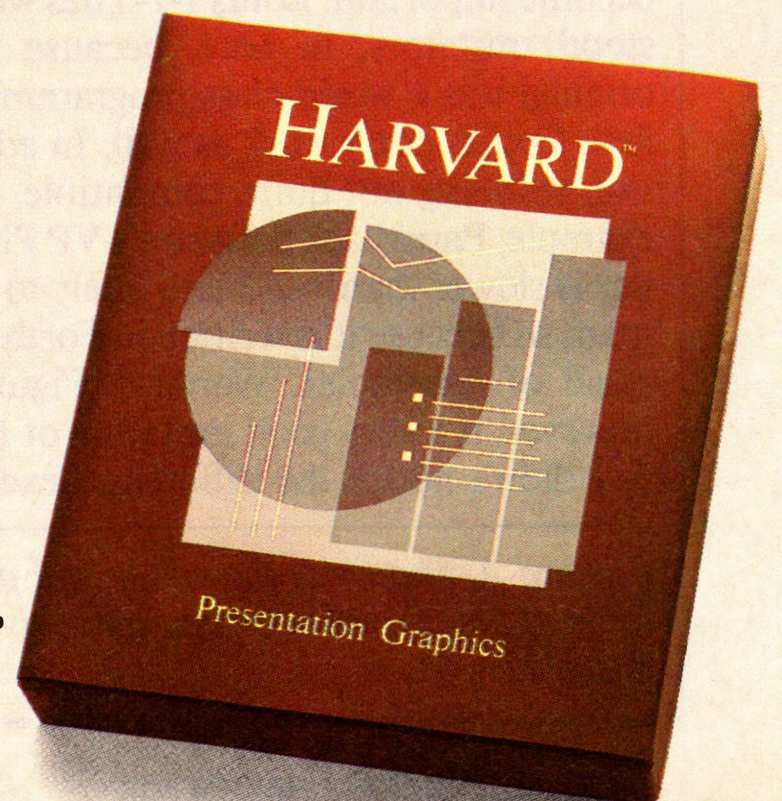
To get top honors for your presentations, call for a free trial size

diskette and graduate to Harvard Presentation Graphics.

For free trial size diskette, call 1-408-848-4391.

Graduate to Harvard Presentation Graphics.

Runs on IBM PC and MS DOS compatibles.
Software Publishing Corporation, P.O. Box 7210 Mt. View, CA 94039-7210.





by Miriam Liskin

Mastering Printer Drivers

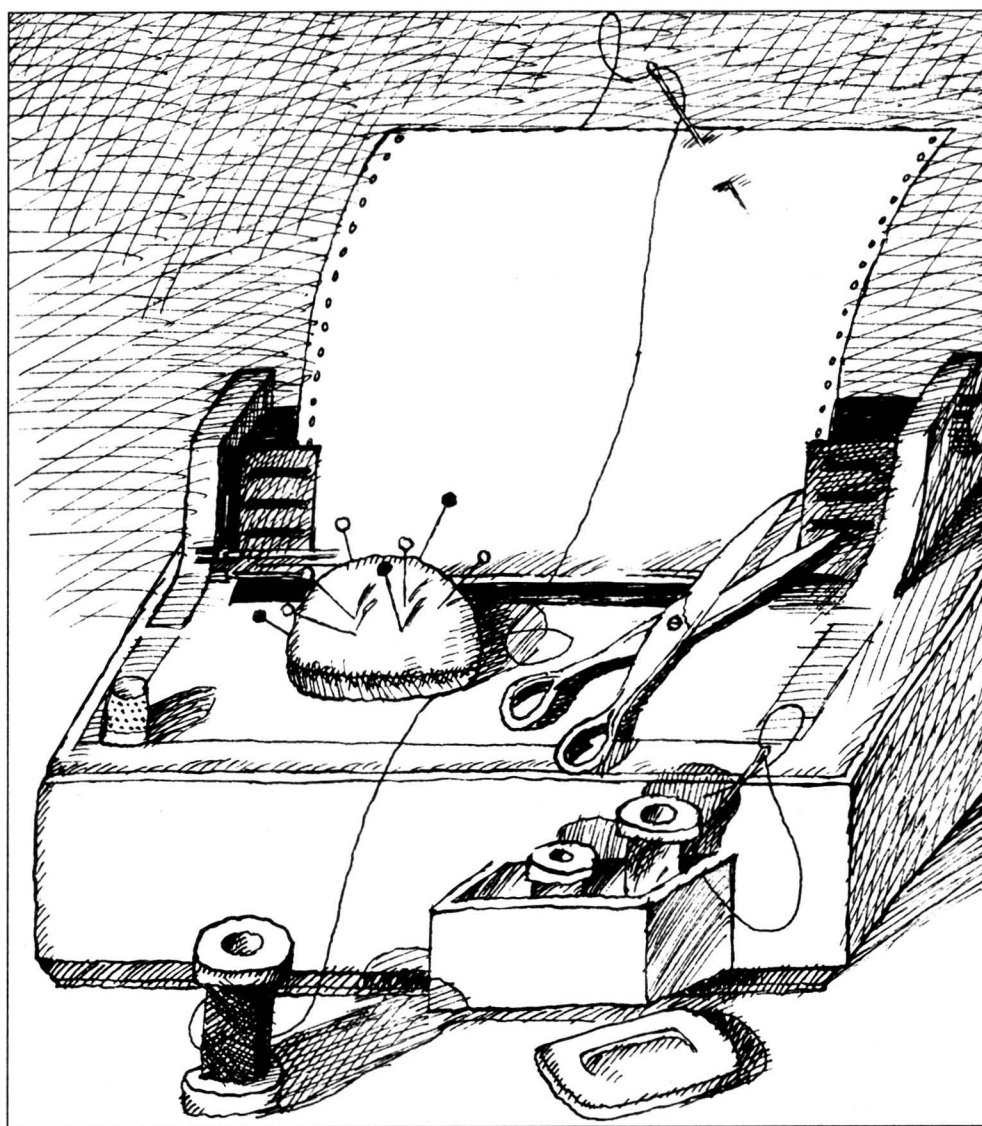
There's no doubt that printers of all kinds are getting faster, less expensive, and more sophisticated. Dot matrix and laser printers today offer more print enhancements and more typefaces in more sizes—all for less money than ever before. If you are lucky, accessing a new printer's special features will be a simple matter of selecting your printer from the menu of choices presented by the installation program that is provided with each of your application programs.

Not all of us are so fortunate, however. In an industry generally lacking in standardization, there is no reason to suppose that printers from two different manufacturers would use the same commands to access the same special features. To make full use of a printer's capabilities, the authors of a program must provide a driver—a program that sends the right codes to the printer to activate those features you want—tailored specifically for that printer.

You may have just purchased a brand new model ABC printer that is not yet supported by the current version of the XYZ word processing program. For that matter, if you are satisfied with the older version of the software, you may be reluctant to pay for an upgrade just to gain additional printer support.

You may have purchased an "Epson-compatible" or a "Diablo-compatible" printer, only to find out too late that it isn't quite 100 percent compatible. With a model that does offer true emulation of another manufacturer's printer, you may prefer to use it in its native mode to take advantage of features not available in the emulation mode. Or you may simply want to make your favorite word processor's font designations be more consistent with your company's typesetter or with other programs that are used in your office.

Switching to a smaller type size to



print a wide spreadsheet or using a near-letter quality (NLQ) mode for an accounting report is relatively simple. First, you need to determine from the printer manual which codes will turn on the features you want to access, and then ascertain from the software documentation how to send those codes to the printer. Your application software itself may provide the means—in the form of a "setup" or an "initialization" string. If not, there are pop-up and stand-alone utilities for this purpose, both public domain and commercial; in the worst case, you (or a more knowledgeable associate) can write a short program in Pascal or Basic.

Many word processors also offer a means for sending any arbitrary command string to the printer to utilize print attributes that are not otherwise supported. Many programs allow you to enter printer commands by typing their ASCII character codes on the numeric keypad while holding down the <ALT> key. Volkswriter uses the dot command `..CMD`, followed by any ASCII character codes, to send longer command strings to the printer, and WordPerfect has an "Insert Printer Code" command included in its "Print

Format" (<ALT-F8>) menu.

The problem is that what you can accomplish this way is limited by the fact that the word processing program cannot take these "unknown" codes into account in formatting the surrounding areas in a document. This is, of course, true with your spreadsheet program as well, which does not "know" whether you have switched to compressed print before printing a worksheet—it is your responsibility to ensure that you have chosen margin settings appropriate to the selected combination of character size and pitch.

With spreadsheet, data base, or accounting programs, this is not often a serious problem, since your most frequent requirement—and often the only one you can easily accomplish without

custom programming—will be to switch type styles once, and use the new font for the entire printout. To use compressed print for a spreadsheet or data base report, for example, you would send a setup string containing the code to turn on compressed print to the printer prior to printing the report. You need not be overly concerned with how to turn off the special print modes, since you can always restore the printer to its default state by turning it off and then back on again.

Word processing applications, however, introduce a host of additional complications, primarily because the software dynamically adjusts the line width and intercharacter spacing, either as you enter text or as it prints a document. If you enter unsupported printer control codes into a file, the program cannot take the resulting font changes into account in forming your text into lines, paragraphs, and pages.

To start with some simple examples, suppose that you have set the line width (the space between the left and right margin column settings) to 65 characters, so that your text, printed at 10 pitch (10 characters per inch), will be centered horizontally on an 8.5-inch

Miriam Liskin, a Berkeley, Calif., writer and consultant, is the author of ADVANCED dBASE III: PROGRAMMING AND TECHNIQUES.

TIPS

page. You can safely embed a command to access an otherwise unsupported 10-pitch print mode on your dot matrix printer.

However, if you switch to an elite (12-cpi) or compressed (typically between 15- and 17-cpi) font, the left margin will appear too narrow on the print-out and the right margin will appear too

wide. Using a different type size for a word or phrase in justified text may make the affected line too short or too long to align with the rest of the text. And if you try to print a centered title in a larger typeface, the starting position of the title will be the same as if you were still printing at 10 pitch—too far to the right for the larger-size characters.

The reason is that the program is calculating the margins and line width in units of characters, and will still send only 65 characters per line to the printer. This is true even with a program like Microsoft Word, which allows you to specify the margins in inches (among other units), since the software takes into account which font is selected when you set your margins. Only if you switch type sizes by using a word processor's own commands can the proper conversions be made.

Some of these problems can be solved using the standard command set of your word processor, provided that you are willing to forego right-justification, to adjust the margins yourself every time you change print size, and to experiment with the placement of large centered titles.

For more sophisticated requirements, these stopgap measures will fall far short of the desired goals. If you want to switch type sizes for a few words in the middle of a line, your right margin will be wrong on that line. Using proportional spacing is even more complicated, since each character is a different width, with letters like "i" and "l" taking up the least space and letters like "M" and "W" occupying the most.

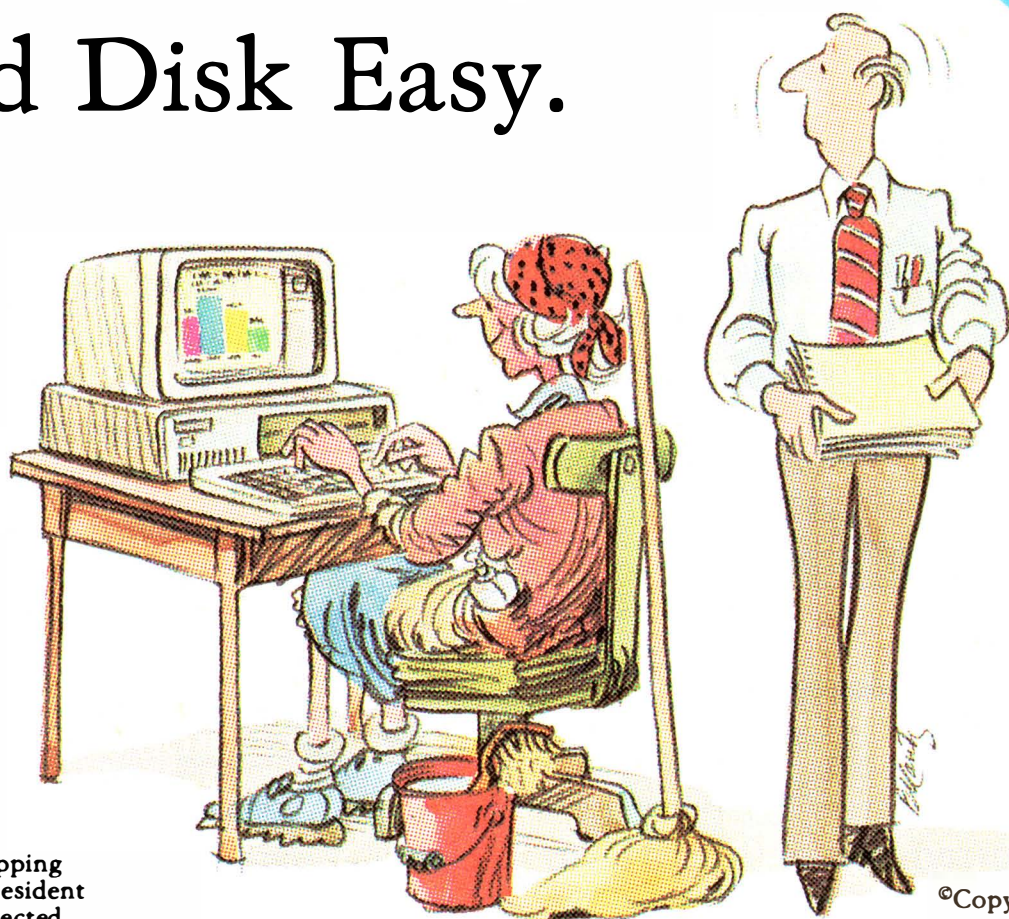
If you turn on a built-in proportional font that is unknown to your word processing software, which still assumes it is using monospacing (i.e., each character is the same width), lines containing many wide letters will extend beyond the right margin, while lines containing a disproportionate number of narrow letters will be too short.

Some programs can print proportionally spaced text on any printer that can move its print head in small enough increments to adjust the intercharacter spacing—the program actually sends a command to the printer after each character to specify how far to move the print head before striking the next character. But even when using a printer's built-in proportional fonts, the program must at least know the relative widths of the characters so it can calculate how many characters belong on each line.

Fortunately, the days are largely past when the only way to install a new printer was to edit and reassemble the driver program or patch the software with a debugger like DDT (under CP/M) or DEBUG (in MS-DOS). Programs like WordPerfect and Volkswriter 3 come with printer configuration utilities that allow you to create a custom

PreCursor® Makes The Hard Disk Easy.

Version 3.00



©Copyright DLAC 1986

Only
\$69.95

Plus \$5.00 shipping
Not memory resident
Not copy protected
30-DAY MONEY BACK
GUARANTEE

1-800-643-9039 Ext. 100

In Texas 1-800-392-6273 Ext. 100

Automatic
Programmable
Intuitive

PreCursor blends these three concepts to give you the best hard disk menu system on the market.

PreCursor puts you in complete control of managing your personal computer's use. With speed and ease PreCursor lets you create a professional menu interface which gives you lightning quick access to the programs you wish to make available. You control the security level.

PreCursor's Utilities Menu provides extensive file management capabilities, including DOS commands and much more. Find or move files, rename subdirectories. Tag files for erasing, copying, viewing, placing in the print queue, or backing up.

Designed from the user up...not the programmer down. Steve Semorile-Chevron.

PreCursor will run on IBM compatible MS-DOS systems and IBM 3270. IBM is a registered trademark of International Business Machines Corporation.

- * Automatic menu generation
- * Rearrange menus with ease
- * Extensive file management
- * Audit trail and report generation
- * Password protection
- * Printer setup menu
- * Color selection
- * Parameter assignment
- * Screen blanking
- * User help screen creation
- * User definable hot keys
- * Excellent hard disk reference guide

Thanks to PreCursor, The Hard Disk isn't so hard anymore.

The Aldridge Company
2500 CityWest Blvd. Suite 575
Houston, Texas 77042
(713) 953-1940

Dealer Inquiries Welcome

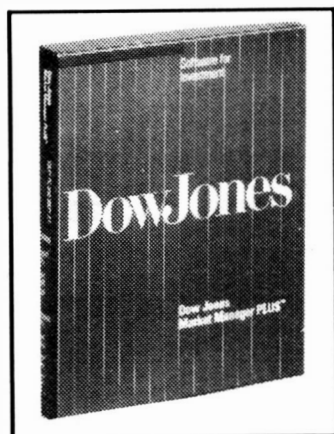
PreCursor®

(For More Information Circle 184)

Announcing Version 2.0!

Market Manager PLUS.™

The investment software that helps you stay ahead of the odds.



In today's dynamic market, staying ahead of the odds means staying on top of your investments—making sure you have the right information at the right time to manage your portfolio effectively.

Market Manager PLUS offers portfolio management for the active investor. By linking you with Dow Jones News/Retrieval®, it provides comprehensive automatic updating and reports.

Here's what's new in Version 2.0:

- IBM DOS support
- Hypothetical portfolios to test investment options
- A calendar that notes interest and dividends due, bonds maturing and options expiring
- Updating of selected portfolios
- Capability to store 256 portfolios with up to 1500 transactions (3800 on fixed disk)
- Security data saved in a DIF® format
- 2400 baud access
- Schedule D tax report
- Portfolio Master report listing pertinent client information
- Plus much more

Market Manager PLUS gives you easy access to the portfolio information you need to make informed investment decisions.

Demonstration disk. Just \$5*.

We've prepared a demo disk to show you how easy it is to manage investment portfolios. Learn how you can stay ahead of the odds. For the demo disk or literature, call:

1-800-221-7700, extension 202.

(Alaska and foreign call 1-215-789-7008 ext. 202.)

To order, call **1-800-257-5114**.

(NJ, AK and Canada, call 1-609-452-1511.)

VISA, MasterCard, and American Express accepted.

*Please add \$2.50 for shipping and handling.

Market Manager PLUS Version 2.0 works with IBM® PC, PC/XT™ and AT™.

Dow Jones™

Software

For Informed Decisions

*"Heads I buy.
Tails I sell."*

Custom forms. Easy.

Isn't it frustrating? You need all kinds of forms to run your business, but your word processor can't draw lines and your graphics software won't type. Now **FormWorx™** lets you create top-quality business forms right on your PC — or modify existing ones quickly and easily as your needs change. FormWorx is fast, neat and flexible.

Design forms easily. You can use solid, double, bold, or dotted lines. And choose from a variety of graphic symbols and type sizes (including compressed type on most printers) using simple commands and pop-down menus. Pick from dozens of possible form sizes including 11" x 14".

Fill out forms perfectly. You can fill out custom or even pre-printed forms on your PC without accidentally crossing a line, using text editing features like on-screen underlining, boldfacing, justification and automatic word wrap. Integrated macros let you automate repetitive tasks, type "boiler plate" phrases

with a single keystroke, jump from one blank to another, and more.

Print the whole form or just the data. On any of 100 printers including the HP LaserJet.

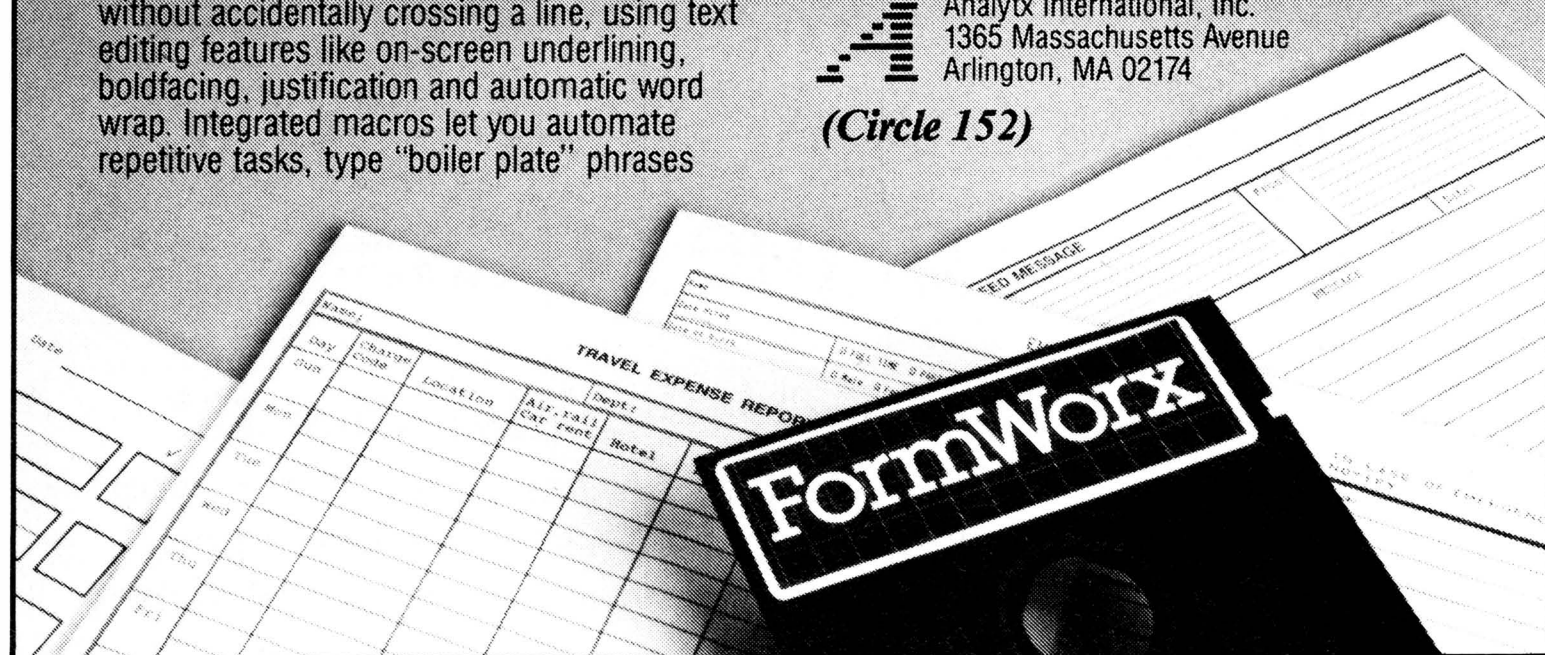
Special offer! For just \$95* you get the complete FormWorx system including sample forms and superb manual with tutorials. Plus free telephone support. Ask your dealer or order directly using your credit card.

1-800-992-0085
(In Mass. 617-641-0400)

Ask about our other products including M.A.C.E.™, the character editor for designing special symbols, and ESCapade™, for getting the most out of your printer.

Analytix International, Inc.
1365 Massachusetts Avenue
Arlington, MA 02174

(Circle 152)



* Includes normal handling and shipping.
Add \$5 for foreign, COD, and POs.

Requirements: IBM PC with 320 KB and DOS 2.0 or higher. Works with or without a graphics board. FormWorx is a trademark of Analytix International, Inc.

PERMA POWER FIGHTS SURGES TWO WAYS...

OR WE PULL THE PLUG

Perma Power Surge Suppressors give you peace of mind, knowing that your computer is protected against power line surges and against suppression element failure.

PROTECTION FROM POWER LINE SURGES

Our unique 2-stage circuit uses heavy-duty metal oxide varistors to protect you against high-voltage lightning-induced surges, and high-speed semiconductor devices to protect against frequent fast surges. Only this kind of hybrid circuit can provide the necessary high power dissipation while still providing fast response time and low let-through voltage.

PROTECTION EVEN IF WORN OR BURNED OUT

Any surge suppressor can wear or burn out.

With Perma Power you can relax! Power to your system is *stopped*... as completely as if the plug was disconnected. Other surge suppressors may use a light or buzzer "warning," while they continue to let raw, unprotected power feed directly into the computer. Only with Perma Power's patented Automatic Shutdown* feature is your equipment kept safe from damaging raw power.

Ask for Perma Power Extended Life Surge Suppressors, in 2, 4, or 6 outlets and Power Control Center models to insure your computer is being protected. At office, computer or electronics dealers nationwide.



*Patent #4,578,579

PERMA POWER®
Electronics Inc.

5601 West Howard Avenue • Chicago, Illinois 60648
Telephone (312) 647-9414

(For More Information Circle 172)

TIPS

printer driver by answering a series of questions. But even running a completely menu-driven printer installation program requires understanding quite a bit about the mechanical operation of your printer and about how it may be controlled through software.

The first prerequisite is a grasp of the types of commands used and how they are expressed. Most printer commands are either single "control characters" (characters with ASCII codes between 0 and 31 decimal) or "escape sequences" (commands beginning with the ESCAPE character, which has a decimal ASCII code of 27) of varying length.

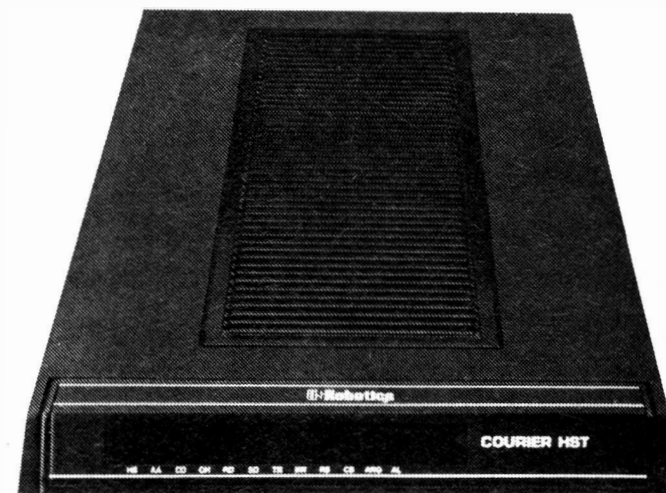
You can usually find a list of these codes in your printer documentation. Sometimes the information is clearly laid out in plenty of detail for the average computer user, while in other manuals there is only a terse command list in an appendix.

The printer commands, especially the non-printable characters that have ASCII codes between 1 and 31, and which have no standard graphic representations, may be expressed in a number of different ways, some of which may be found in the same manual. The most common representations use the decimal (base 10) ASCII codes, hexadecimal (base 16) ASCII codes, and mnemonics (abbreviated names). The characters "Control-A" through "Control-Z" may also be written using the abbreviation CTL or CTRL or the symbol ^ for "control," sometimes with the entire expression in brackets. Occasionally you'll find binary (base 2), or some entirely different system.

For example, "Control-O," which turns on compressed print on Epson printers, may be written as 15 (decimal), 0F (hex), 1111 (binary), ^O, [CTRL-O], <CTL-O>, or SI (the mnemonic, an abbreviation for SHIFT IN). A good ASCII table—such as SideKick's, or the one in the IBM PC Basic manual—that lists the decimal, hexadecimal, control, and mnemonic representations for the 256 ASCII characters, can be invaluable in interpreting printer codes. One code worth memorizing is "escape"—the prefix for almost all printer command sequences you'll encounter. This character, whose ASCII code is 27 decimal, or 1B hexadecimal, is referred to by its full name, its mnemonic (ESC or <ESC>) and a number of less standard notations, including, in the HP LaserJet manual, a superscripted "E" followed by a "c."

Printable characters may appear in

Get the Courier HST™ 9600-bps modem. Then watch the rest of the world play catch-up.



USRobotics new high speed technology delivers over 1,000 characters/second on more dial-up phone lines. For less than \$1,000.

The new Courier HST (High Speed Technology) dial-up modem combines four great ideas that add up to a new standard for personal computer data communications.

It's full-duplex, with high speed (9600-bps) and low speed (300-bps) channels—automatically assigning the high speed channel direction. This asymmetrical solution avoids the problems of echo-cancelling technology or inefficient half-duplex schemes.

The most powerful data signalling technique—Trellis Encoded Modulation—lets Courier HST achieve maximum speed over a much wider range of phone line conditions than other 9600-bps modems.

A unique error- and flow-control method allows Courier HST to send up to 1,100 characters a second over long distance phone connections.

It's familiar as any 2400- and 1200-bps modem. Same features, commands and, in most cases, the same software. In fact, Courier HST automatically falls back to 2400, 1200 and 300-bps, connecting you with nearly all modems.

High speed. High accuracy. High value. And a two-year parts and service warranty. Get the USRobotics Courier HST, priced under \$1,000. And watch the rest of the world play catch-up.

**CALL 1-800-DIAL-USR
In Illinois (312) 982-5001
(For More Information Circle 22)**

Yes, please send me your FREE 8-page book explaining the new Courier HST and today's new high speed technology.

Name _____

Title _____

Company _____

Address _____

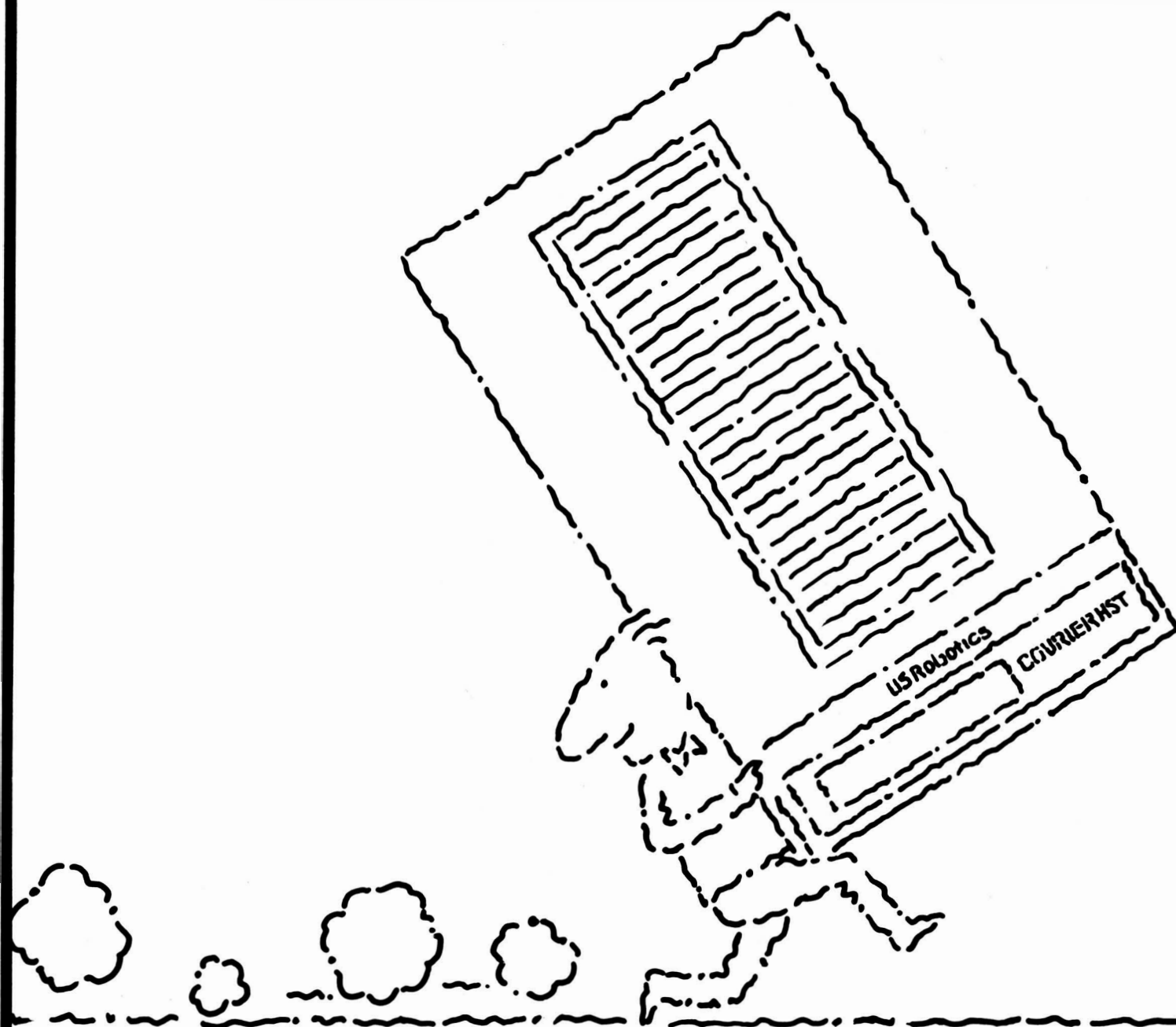
City _____ State _____ Zip _____

Business Phone () _____

3/87-PC-HST.

USRobotics™

The Intelligent Choice in Data Communications.
8100 McCormick Blvd., Skokie, Illinois 60076.



TIPS

their usual forms, or as numeric codes. For example, ESC D would mean the “escape” character, followed by a “D”—not to be confused with the hexadecimal equivalent of decimal 13, which generally appears as 0D. Also note that “D” and “d” are usually not equivalent in printer commands. The mixed notation can be especially confusing in com-

mand sequences containing numbers for part of the control sequence. For example, the command to turn on “correspondence quality” mode on many Oki-data printers is ESC 1. Only from the decimal and hexadecimal equivalents can you determine that you should use the character “1”, not the character whose ASCII code is 1. In some cases, there is

no way to be sure which of these alternatives is intended, and you’ll have to try both and see which one works.

Some special print modes are turned off automatically at the end of a line of text, when the printer receives a carriage return and line feed. Many others are initiated by one control code sequence, and turned off by another. For example, double-strike printing on the Epson FX series of printers is initiated with ESC G and cancelled with ESC H. Certain print elements for NEC letter quality printers contain up to 34 extra characters in addition to the usual 94 keyboard characters. This “alternate” character set is accessed by sending a CONTROL-N to the printer; CONTROL-O returns to the printing of the standard characters.

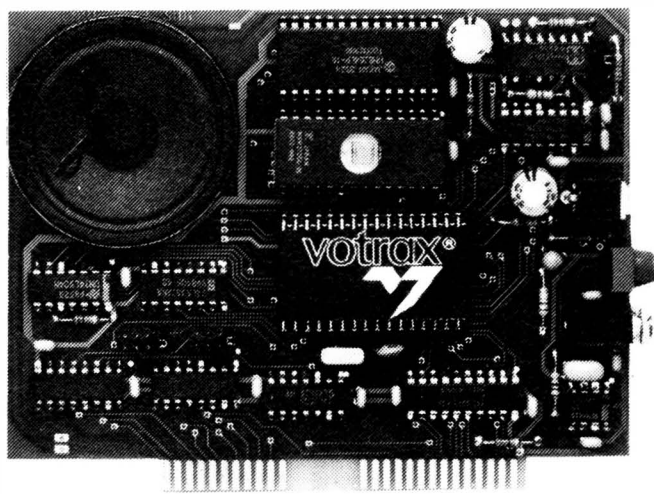
The way the code sequences must be expressed for the word processor installation program may or may not match the notation in the printer manual—or any of the standards described above. In the WordPerfect PRINTER program, for example, you enter non-printable characters by placing the decimal ASCII codes within angle brackets—<15> for “Control-O”—and Microsoft Word in some cases requires that the ASCII codes be expressed in octal (base 8!).

Some word processors, including WordPerfect, MultiMate, and Volkswriter, contain menu-driven printer installation utilities that construct a new printer driver based on the answers you give to a series of questions about your printer. While the sequence and wording of the questions will vary, most installation customizing programs will ask the same types of questions.

The most basic questions involve global aspects of the printer’s behavior: Does it recognize a “form feed” command to move to the top of the next sheet of paper or must the software send the correct number of individual line feeds instead? Does it require a line feed after each carriage return or supply its own? Can it perform a return and line feed separately? Can it backspace? Can it roll the paper back to the previous line? The answers to these questions are often considered too elementary to be stated explicitly in the printer manual, but you can usually deduce them from the command list—if it includes a code to perform a “negative line feed,” you can assume that the answer to the vertical backspace question is “yes.”

Also, the consequences of answering

ONCE AGAIN VOTRAX PRESENTS THE MOST ADVANCED TECHNOLOGY IN VOICE SYNTHESIS



Some companies take their accomplishments and customers for granted. Before they know it their technologies become obsolete and their products are replaced by competitors’ products that are better, faster, smaller or easier to use.

At Votrax, we never take our successes lightly. The **Votalker 2000** is a result of our continuing research and development. 14 years ago Votrax pioneered the voice technology industry, offering its customers high-quality products at competitive prices. Today that tradition continues.

The Votalker 2000 is our newest speech synthesizer for use with IBM® personal computers* and compatibles. Its features include superb voice quality, expanded software and hardware controls, simplified programming procedures, and the ability to operate with off-the-shelf software.

So if your computer application requires voice, remember Votrax for speech chips, add-on boards and stand-alone technology that talks.

Contact Votrax today for more information at **313-588-2050**.

For demonstration call: (313) 588-2926

IBM® is a registered trademark of International Business Machines, Inc.

*IBM PC, XT, AT AND COMPATIBLES.



VOTRAX INTERNATIONAL, INC.
1394 Rankin
Troy, Michigan 48083-4074
(313) 588-2050 TWX-8102324140
Votrax-TRMI

(For More Information Circle 165)

End Financial Hassles. \$49. Guaranteed.

FREE!
WITH QUICKEN

It's tax time again. Wouldn't it be great if your computer could hand you the numbers you need? Now it can with Quicken®, the breakthrough financial software for business and home.

Quicken does the paperwork for you.

The secret is automatic macros that eliminate repetitious clerical work. It writes checks, keeps the books, tracks spending, and reconciles...all automatically.

Need to know your charity spending? Fire up Quicken and select the Search & List feature. Type "charity" and the time period you want, press one key, and zap, there on your screen is the total dollar amount and a list documenting every item of the deduction (showing date, payee, memo, dollars, and check number). Want a paper copy? Press another key and it's yours.

Need medical, business, T & E, or other expenses? Need income and expenses by rental property, by job, or by client? The answer, and the itemized list, are just keystrokes away.

And Quicken also links to 1-2-3,®* Symphony,®* and AppleWorks.® You design the financial reports exactly as you need; Quicken's Transfer* automatically fills in and updates your spreadsheets every month.

Critics Hail A Breakthrough



—InfoWorld Review Board

"It's more than good—it's indispensable. Home and small business checking software used to be too expensive, too hard to use, too rigid, and it took too long to use. Quicken has changed all that."

—Ken Landis, A + Magazine

"...truly saves time when it comes to paying bills and keeping track of tax-deductible items."

—Parents Magazine

"I've never seen such an easy-to-use manual or software that's so simple to use."

—Martin Blumenthal, InCider Magazine

Quicken eliminates hassles every month.

It's bill-paying time. Select Quicken's Write Checks feature, press two keys, and zap, Quicken's macros write out the first check, letting you pick how much to pay. Quicken prints the checks. You just sign them and slip them into Quicken window envelopes.

While it's working, Quicken updates your records, balances, and saves to disk...all automatically. Need to record a check you wrote at the store? No problem. Quicken's macros update your records in an instant. Dread reconciling the checkbook? Quicken makes it simple. And it's so automatic it even helps fix your mistakes!

Vastly faster and simpler than old-style finance software.

Quicken is the first finance software that's truly simple. No accounting mumbo-jumbo (no "debits," no "parameters"). The first that's truly fast...200% to 300% faster than old-style finance software. The first that's actually recommended by leading banks across the U.S. and Canada.

For every business and home—whether you pay 15 or 500 bills per month. Handles unlimited numbers of expense categories.

At \$49, Quicken pays for itself.

With our unconditional 30 day money-back guarantee, you can't lose. Order now and get the Tax Reform Analyzer as a free bonus!

* Quicken's Transfer is included on the Apple program disk. The IBM version comes on a separate disk costing \$15.

Product names are trademarks of their respective manufacturers.

Quicken

Call **800-624-8472** (In CA call 800 468-8481) Or send coupon with payment to

Intuit, 540 University Ave., Palo Alto, CA 94301

30-Day Unconditional Guarantee: If not completely satisfied, return Quicken within 30 days for full refund, but feel free to keep Tax Reform Analyzer.

☐ Quicken and Tax Reform Analyzer, \$49.

☐ Quicken Transfer Utility for IBM (not needed for Apple), \$15.

☐ Tax Reform Analyzer without Quicken, \$29.

Please enclose \$3 shipping and handling, (plus sales tax if in CA). Check one:

☐ Check enclosed

☐ Visa

☐ MasterCard

Card# _____ Exp. Date _____

Name _____ Daytime Phone _____

Address _____

City _____ State _____ Zip _____

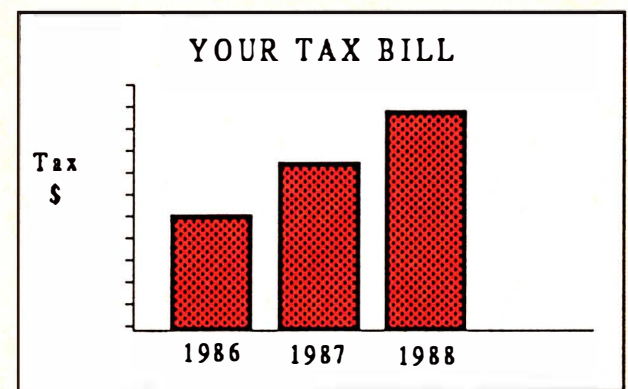
Beat the New Tax Law. \$29.

The new Tax Reform Act is creating a new class of winners and losers. The winners are using the new law to slash their taxes.

Quicken's new Tax Reform Analyzer gives you the answers you need:

Does the new tax law help me or hurt me? By how much? What should I do to cut my taxes under the new law? How must I change my withholding to avoid IRS penalties?

No knowledge of the new law is needed. Just type the key numbers from your last tax return into the Analyzer. The Analyzer does all the calculations and shows tax returns, concise summaries, and graphs** of your taxes for 1986, 87, and 88.



The Analyzer tells you what to do to cut your taxes and how much you'll save each year. You can save hundreds or thousands of tax dollars starting right now!

The Analyzer is powerful—it handles your 1040 and schedules A, B, D, E and W, plus the new W-4 form. Yet, it's easy because it's a disk of worksheet templates that run on Lotus®, AppleWorks®, and other popular spreadsheets.

Incredibly, the Analyzer costs only \$29! So order today, or buy Quicken and get the Analyzer FREE as a tax time bonus.

Details are also in specially marked boxes of Quicken. Free offer expires 4/15/87.

**AppleWorks and Multiplan do not graph.

Compatibility:

Quicken: IBM® PC, XT, AT, PCjr and compatibles with 192K RAM. Apple® IIGS, IIc and IIe (IIe requires extended 80-column card) with 128K RAM. One or two floppy disk drives or hard drive (3.5" drives OK). Any printer. No modem or spreadsheet software required.

Tax Reform Analyzer: Requires Lotus 1-2-3, Symphony, SuperCalc4®, Multiplan®, AppleWorks®, or compatible spreadsheet.

Not
Copy-
Protected

Intuit

Authorization Code PE0387

INVESTMENT SOFTWARE

For IBM PC (or close compatibles)
FREE DELIVERY, NO C.C. FEES
All Packages Fully Vendor Supported

TECHNICAL ANALYSIS

<i>General Market</i>		
Cmptr. Asset Mgmt., The Technician	Call	
N ² , Market Analyzer - XL	325	
<i>Stock Analysis</i>		
Cmptr. Asset Mgmt., MetaStock	Call	
N ² , Stock & Futures - XL	325	
MicroVest, High-Tech	275	
Summa, Winning on Wall Street	199	
Telescan, Telescan Analyzer	45	
<i>Market Timing/Trading Strategies</i>		
Eng. Mgmt. Consultant, Fourcast (Stocker 1) (Uses Moving Window-Spectral Method)	250	
Wm. Finnegan, The Market Forecaster (Projects Market Move/Directions)	299	

FUNDAMENTAL/SCREENING

<i>Value Line, Value Screen Plus</i>		
Monthly Updates	287	
Quarterly Updates	174	
<i>Standard & Poor's Stock Pak II</i>		
6 month subscription	124	
Savant, The Fundamental Investor	375	
MP Software, Market Base (OTC)	99	
American River, The Mutual Fund Investor	124	

PORTFOLIO

Batteries Included, Isgur Portfolio System	199	
Performance Tech., Centerpiece	Call	
Smith Micro, Stock Portfolio System	185	
Pinstripe, Visible Asset	885	
Best Programs, PC/Investor	95	
Bullish Investment, Net Worth	49	

OPTIONS

CalcShop, OpVal Advanced	144	
MarketSoft, Personal Options Advisor	198	
Eng. Mgmt. Consultant, Fourcast (Stocker 1)	250	
CalcShop, OST (Options Tutorial)	49	

BONDS

<i>Decision Programming</i>		
Master Brain II Bond Calculator	325	
Davidge Data Systems, Bondware	399	
Davidge Data, Bondware Yield Calc. Screen	65	

REAL ESTATE

HowardSoft, Real Estate Analyzer III	288	
Realty Software, Property Management Plus	639	

COMMODITIES

MicroVest, High-Tech	275	
MicroVest, Back Trak (Trading System)	625	
N ² , Stock & Futures - XL	325	
Technicom, Profit Catcher III	745	
Technicom, Account Manager II	465	
Gannsoft Pub. Co., Ganntrader	695	

COMMUNICATIONS

QFS, Data Connection (quotes CompuServe)	95	
Cmptr. Asset Mgmt., DownLoader (Warner)	49	

GAMES/SIMULATIONS

OCO, First Option	59	
OCO, Speculator (Futures Market)	59	
OCO, Wall Street The Stock Market Game	59	
Blue Chip, Tycoon (Commodities)	49	
Blue Chip, Millionaire (Stocks)	49	
Blue Chip, Managing for Success (Bus.Mgmt)	49	

OTHER FINANCIAL

Best Programs, PC/TaxCut (1986 Taxes)	95	
Best Programs, PFP II (Expense Acctg. Sys.)	95	
ILAR, Bottomline-V (Planning Sys.)	395	
EXSELL (Sales Prospecting)	375	

Other fine packages available for your investment needs.
For 24 hour ordering and product information, visit
INVESTMENT SOFTWARE in the Electronic Mall™ on
CompuServe. Enter GO IS

TO ORDER CALL

1-717-323-3276 in PA

1-800-228-6655

Mon. thru Thurs. 11 a.m. till 9 p.m. EST

SCIX Corp.

2010 Lacomie Street, P.O. Box 3244
Williamsport, PA 17701

Free shipping by UPS ground, no credit card fees. PA residents add 6% sales tax.
No COD's or P.O.'s, all checks allow 10 days to clear. All merchandise new and un-
used, we do not guarantee compatibility. No returns except for defective merchan-
dise. Prices and availability subject to change without prior notice. Eff. 2/1/87.

TIPS

these questions wrong are very predictable—instructing the program to add a line feed where none is needed will yield double-spaced printouts, while failing to provide a required line feed will result in the entire document being printed on one line. If a printer can't recognize form feeds, it will print over the perforations on continuous paper instead of paginating your document.

Just arriving at the right combination of these few simple options can take a moderate amount of experimentation for a novice trying to decipher a poorly written printer manual. A few procedural guidelines will help immeasurably. First, make a copy of a driver for a printer as similar to yours as possible and modify it, rather than constructing a new driver from scratch. Second, study a few existing drivers, preferably for similar printers, to solidify your understanding of the command structure. Third, when you begin to experiment, make just a few—one or two—changes at a time and evaluate the effects by printing a test document before you go on. This way, if you get a garbled print-out, you'll be able to isolate the offending command sequence.

The more sophisticated print enhancements will require a better understanding of how printers work in general and of your printer in particular. The manual will usually not address methods of printing that are irrelevant to the printer at hand; you may have to infer the answers to questions about which method to use by searching for commands to carry out each.

The easiest parts of the definition process involve print enhancements that are activated and deactivated with single code sequences. For example, on many dot matrix printers, you can switch typestyles or sizes, or turn on a built-in italic mode with an escape sequence, and turn it off with another to return to the previous print mode.

Installing a seemingly simple feature, like boldfacing, may be confusing, because this feature can be implemented in quite a few different ways. Many daisywheel and dot matrix printers have an automatic boldfacing mode that is turned on and off much like the italic mode described above, with control codes or escape sequences.

A printer may offer both a double-strike mode, in which each character is printed two or more times, usually in exactly the same position but sometimes slightly below, and an "empha-

sized" or "shadow" mode, in which the print head moves forward a fraction of an inch before reprinting the character. You'll have to try both to see which yields a more pleasing result.

Printers that cannot advance the print head in small enough increments must boldface by striking each character repeatedly in the same position, and you may be offered the choice of how many strikes you want. Furthermore, there is more than one way to carry out this operation. Some printers can reprint a character several times without advancing the print head, while others strike each character, backspace, and restrike it. Printers that can't backspace must issue a carriage return with no line feed and make another pass across the entire line, restriking only the selected characters.

On typesetting machines and laser printers, boldfacing is implemented not as an enhancement that can be applied to any typeface, but rather as a completely separate font. Turning off boldfacing is accomplished by switching back to the font previously in effect, which with some programs (such as WordPerfect) requires that you include a special command to "remember" the current font setting in the "turn bold on" command sequence.

Entering the commands to switch character size and spacing is often a lot more complicated. With many dot matrix printers, only a finite number of horizontal spacing (pitch) values are permitted—for example, 10, 12, and 15 cpi—and each is associated with a specific type size. But the relationship is not always immutable. You may be able to select 10 or 12 cpi for a particular near-letter quality font, with the characters appearing slightly more crowded, but not unacceptably so, at 12 cpi.

Most daisywheel printers can "microspace," which means that the mechanism can move the print head in very small increments—1/120 inch horizontally and 1/48, 1/72, or even 1/216 inch vertically. You can set the horizontal or vertical spacing as a multiple of these units, independent of the character size, which is of course determined by the print wheel. Printing at 10 characters per inch with a print wheel designed for 12 cpi (a very common mistake) simply results in widely spaced text, and you can easily print at 18 cpi with a print wheel designed for 15.

To install such a printer that can microspace (this class does include

(For More Information Circle 193)

GOODBYE, IBM...



THANKS FOR THE MEMORIES

Have you ever noticed how time seems to change everything? Fashions change. Technology changes. Even the microcomputers we use change. Maybe that's why so many of our customers are saying goodbye to IBM in favor of a "good buy" from Wells American.

As time goes by, more and more computer users are realizing what an extraordinary value our A★Star II® truly is. It's the *only* AT class microcomputer that can run at 6, 8, 10 and 12 MHz! It's also the *only* PC/AT compatible that's "network ready." Better yet, each A★Star II now comes with your choice of keyboards - the original AT version or the enhanced "RT" style. Best of all, A★Star II prices start at only \$995!

But what about quality and support? Don't worry! We've been making microcomputers *longer* than IBM! And it shows. Our A★Star® computers have been top

rated by leading industry trade journals. Even so, we've heard that some "big blue" old-timers still worry about trading their IBM "security" blanket for better priced, higher performance equipment. (Remember how difficult it was to give up *your* baby blanket?) That's why we've arranged

for RCA, one of the world's largest technical service organizations with 18,000 employees, to provide low cost, nationwide maintenance for our A★Star II. And if that's not enough, every unit includes free schematics and a no risk money-back guarantee.

THE A★STAR II IS MADE IN THE USA.



Still need a blanket? We've got you covered! Try out one of our A★Star II's and we'll send you one. It's baby blue, monogrammed and...it's absolutely free! We'll also include a \$395 option, at no charge, with your first A★Star II purchase. This offer is limited, so call or write us today. Just because you'll be saying goodbye to IBM doesn't mean you'll have to say goodbye to quality, support *or* security. Besides, at least you'll still have your memories...and your money!



Corporate Headquarters: 3243 Sunset Boulevard • West Columbia, South Carolina 29169 • 803/796-7800 • TWX 510-601-2645

IBM, Personal Computer AT and AT are trademarks of International Business Machines.

(For More Information Circle 23)

MicroCom Systems
OUTSTANDING SOFTWARE
 For IBM PC's and Compatibles

\$350 PER DISK
 SMALL QUANTITIES

\$300 PER DISK
 FOR TEN OR MORE

\$1 OFF 5 DISKS OR MORE WITH THIS COUPON

- ☐ **BUSINESS 1**—EZ-Forms business form generation, completion and printing program.
- ☐ **CAD 1**—Altamira, a 4 color object oriented drawing program. Color required.
- ☒ **COMM 4a,b,c,d,e**—(5 disks) Latest RBBS Bulletin Board System 14.1D.
- ☒ **DATABASE 1a,b**—(2 disks) File Express menu driven general purpose database mngr.
- ☐ **EDUCATION 1**—Interactive DOS tutorial for new PC users. Makes learning DOS painless.
- ☐ **GAMES 1**—3-D PacMan, Kong, SpaceWar, JanitJoe, and more. Color required.
- ☐ **GAMES 2**—Qubert, Pango, Centipede, Monopoly, Zoarre, and more. Color required.
- ☐ **GAMES 3**—Blackjack (you set rules), Arm Chair QB, and Empire (War Game).
- ☐ **GAMES 4**—Castle, StarTrek, and the original Colossal Caves Adventure.
- ☐ **GAMES 5**—The Hack adventure game from the universities. Like Rogue, only more complex.
- ☐ **GAMES 6**—Pinball, Othello, Dragons, Sopwith (fly one), and more. Color required.
- ☒ **INFO 1a,b**—(2 disks) Cooking recipes database with keyword/ingredient retrieval.
- ☐ **LANGUAGE 5**—Turbo Pascal interactive debugger, pop-up help, formatters, et cetera.
- ☐ **LANGUAGE 7**—Complete Pascal interpreter/compiler. Great for learning Pascal!
- ☐ **ORGANIZER 1**—DeskMate, a Sidekick clone, and the Judy calendar program.
- ☐ **PINUP 2**—Provocative high res digitized graphics pinups. Graphics required.
- ☐ **PRINTER 1**—Font and sideways utilities, spoolers, banner makers, and more.
- ☐ **UTILITIES 1**—A collection of invaluable general purpose DOS utilities. A must!
- ☐ **UTILITIES 2**—More invaluable DOS utilities. Too many to list here!
- ☐ **UTILITIES 3**—A comprehensive set of debugging and diagnostic utilities.

PE-387

NEW RELEASES/UPDATES

- ☒ **CAD 2a,b**—(2 disks) An advanced 2D/3D drafting prog. 640k and color required.
- ☒ **COMM 1a,b**—(2 disks) Version 2.4 of the ever-popular Qmodem comm. program.
- ☒ **COMM 2a,b**—(2 disks) Procomm 2.42, an excellent modem program with terminal emulation.
- ☐ **EDUCATION 2**—Learn the Presidents, States (and capitals) and more. Color required.
- ☐ **EDUCATION 5**—Learn Origami, the Japanese art of paper folding. Color required.
- ☒ **FINANCES 3a,b**—(2 disks) Express Calc 3.12, a powerful spreadsheet program.
- ☐ **GAMES 8**—Striker helicopter attack, and Risk, world domination. Color required.
- ☐ **GAMES 9**—EGARisk, the game of world domination in very high resolution. EGA required.
- ☐ **GAMES 10**—Solitaire, Teed-Off golfing, and Sailing in the Bermuda triangle. Color required.
- ☐ **GAMES 12**—MyChess (9 levels), Backgammon, and Wheel of Fortune. Color not required.
- ☐ **GRAPHICS-1**—Record and play back screen images! Excellent for demo, etc. Color required.
- ☒ **INFO 2a,b**—(2 disks) Zip-Phone, national areacode/ prefix to zip-code cross reference.
- ☒ **LANGUAGE 3a,b**—(2 disks) The A86 2.18 macro assembler and debugger.
- ☐ **SHELL 4**—Automenu menu facility, and HDM II 4.04 hard disk menus.
- ☐ **UTILITIES 5**—Utilities for formatting, parking, and optimizing hard disk drives.
- ☐ **UTILITIES 6**—Advanced utilities including Dpath, Esc, Hotdos, Resident program utilities.
- ☐ **UTILITIES 7**—More Advanced utilities including MasterKey (undeletes files from hard disks).
- ☒ **WORD 1a,b**—(2 disks) PC Write 2.7, a powerful word processing system, w/spell checker.

Catalog available, add \$.35" format add \$1/disk.

Cost of Items

CA Res 7% Tax

Ship/Handling

Total Enclosed

MicroCom Systems

(415) 325-6500

P.O. Box 51657, Palo Alto, CA 94303

TIPS

some dot matrix as well as daisywheel printers), you must specify the smallest units of horizontal and vertical motion and the commands used to set the horizontal and vertical spacing. The actual units used by the program may be the same as the physical increments of print head motion, or a more arbitrary unit. For example, you might enter the "horizontal motion increment" as 1/120 inch, and then provide the command to set the horizontal spacing to a particular value, expressed in 1/120 inch. Microsoft Word, on the other hand, uses "twips" for most printers; a twip is 1/1440 inch (note that 1440 is evenly divisible by 48, 72, and 120, which facilitates easy conversion to the printer's physical unit). For laser printers, it uses units of 1/300 inch, to match the resolution of these printers.

With some printers, in particular dot matrix printers, the character size is more closely related to the pitch—selecting "compressed" print, for example, changes both the size of the characters and the horizontal pitch (typically yielding between 15 and 17.5 cpi). Most programs handle these selections as font changes, rather than as horizontal pitch changes.

For proportionally spaced fonts, there is even more work to be done. You must specify the width of each character, generally in the standard unit used for horizontal motion—1/120 inch—or in twips. This information is contained in a "character width table" or "spacing table" that allows the printer to advance exactly the right number of increments after striking each character to produce the desired spacing.

In addition, if you need to print characters that are not part of the normal printable character set, you must define the commands for producing these characters. This may involve combining two characters—for example, to produce an accented "a" on a daisywheel printer, you might have to print an "a", backspace, and then print the accent mark. For more esoteric symbols, you might have to issue the command to switch to an "alternate" character set, print some character, which may not resemble the symbol itself, and then return to the standard character set. On a laser printer, you might have to switch font cartridges to access characters not present in the font you normally use.

Some programs, such as WordPerfect, combine this "character table" with the spacing table that specifies the

character widths; with Microsoft Word, you must enter two separate tables; and Volkswriter 3 uses a file that is completely separate from the printer description file to establish the correspondence between characters as they are displayed on-screen and are printed.

Sometimes the most powerful and flexible programs are the hardest to set up, especially when combined with a less-than-user-friendly installation procedure. As virtually all the configuration programs warn you, editing the printer drivers requires a degree of sophistication from the user, and some, in particular Microsoft Word, almost assume you are a programmer.

The procedure used by Word is of a different sort than the menu-driven question-and-answer techniques of programs such as WordPerfect or Volkswriter 3. Word offers instead a utility called MAKEPRD.EXE, which converts a .PRD file to a "standard" (standard only to Word) text file format, or vice versa. While you can create a text file from scratch and turn it into a .PRD file, typically you would convert an existing .PRD file to a text file, edit the text file, and then convert the result back to a .PRD file.

The format of the file reflects the flexibility offered by Word to customize the program for almost any type of output device. The file format consists of keywords, each of which represents a printer feature or function, followed by a code representing the feature (for example, PrinterType:5 denotes a laser printer) or the command sequence required to implement the function. After a header section describing the printer in general, a section follows that describes each font, and within each font, each type size. To create nonstandard characters, you can include a "character translation table" and for proportional fonts, a "character width table."

Some of these procedures are intimidating enough to induce you to buy only a popular printer that is sure to be supported by most software, or one that closely emulates such a printer. While it is true that constructing a printer driver from scratch is a formidable task, making a few changes to optimize, personalize, or enhance an existing driver is a perfectly realistic goal. You may find that the time you spend learning and experimenting (and often, cursing) pays off handsomely in an enormously improved understanding and appreciation of the inner workings of your computer, printer, and word processor. ■

(For More Information Circle 199)

REFEREE™ KEEPS PEACE ON THE RAM-FIELD

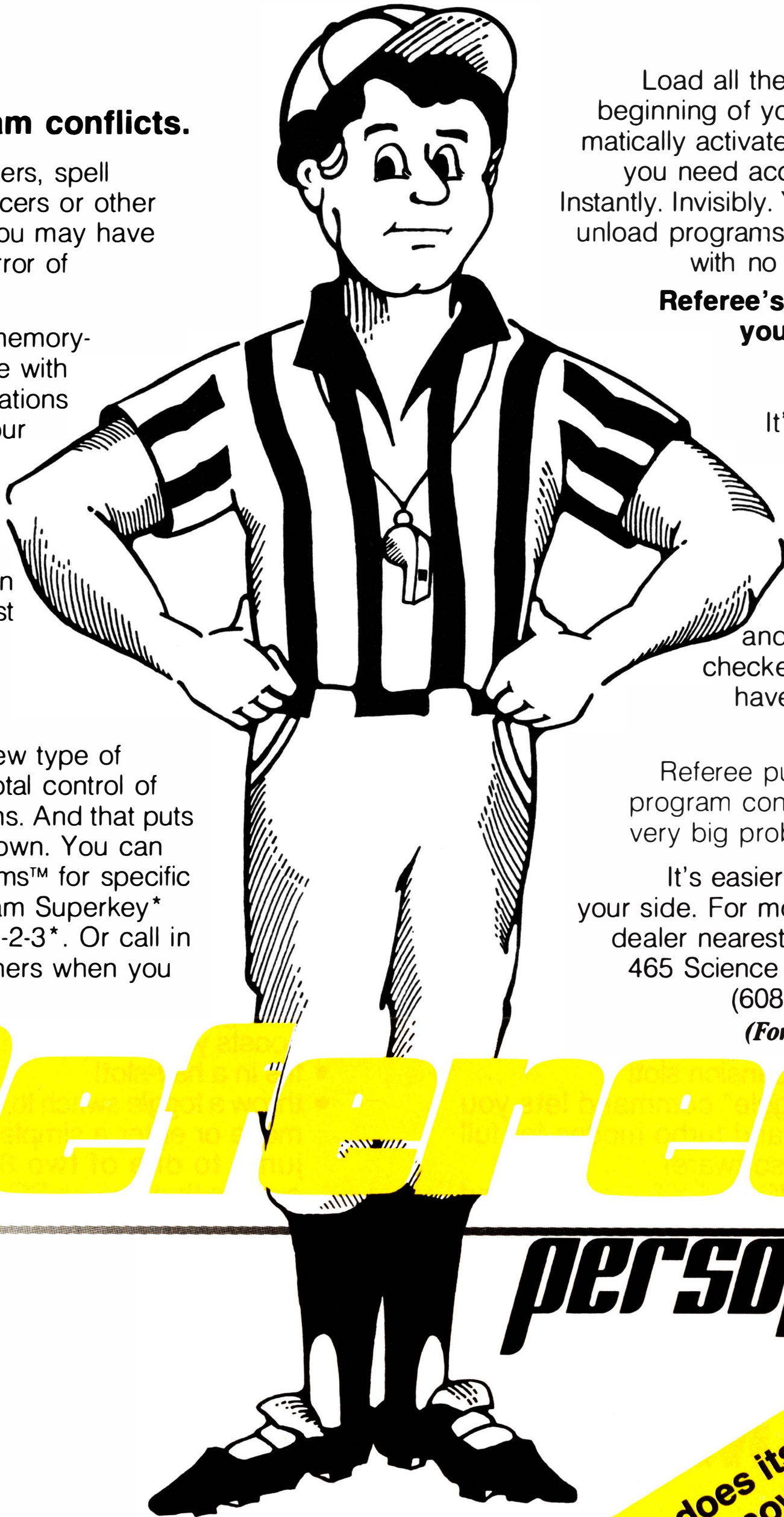
Referee manages RAM-resident program conflicts.

If you use desktop organizers, spell checkers, keyboard enhancers or other RAM-resident programs, you may have already discovered the horror of "RAM Cram."

RAM Cram occurs when memory-resident programs compete with each other (and with applications programs) for control of your keyboard or other computer resources. It's a fierce competition that can cause your computer to lock up completely. Then *you* pay the penalty—in lost time and lost data.

With Referee, you make the rules.

Referee, by Persoft, is a new type of software that puts you in total control of your RAM-resident programs. And that puts Referee in a league all its own. You can create your own RAM Teams™ for specific applications programs. Team Superkey* and Sidekick* with Lotus 1-2-3*. Or call in Prokey* and bench the others when you switch to dBASE III*.



Load all the programs you need at the beginning of your work day. Referee automatically activates and deactivates the ones you need according to *your* set of rules. Instantly. Invisibly. You can also use Referee to unload programs from memory—even those with no unload option of their own.

Referee's Sideline™ menu enables you to control RAM-resident programs from within an applications program!

It's ideal for integrated packages like Symphony*. You can use a keyboard enhancer with the spreadsheet module. Or deactivate it, enter the word processing module and activate your favorite spell checker. It's easy. And you never have to back all the way out of the program!

Referee puts an end to RAM-resident program conflicts. At \$69.95, it solves a very big problem for a very small price.

It's easier to win with the Referee on your side. For more information, and for the dealer nearest you, contact: Persoft, Inc., 465 Science Drive, Madison, WI 53711, (608) 273-6000—Telex 759491.

(For More Information Circle 45)

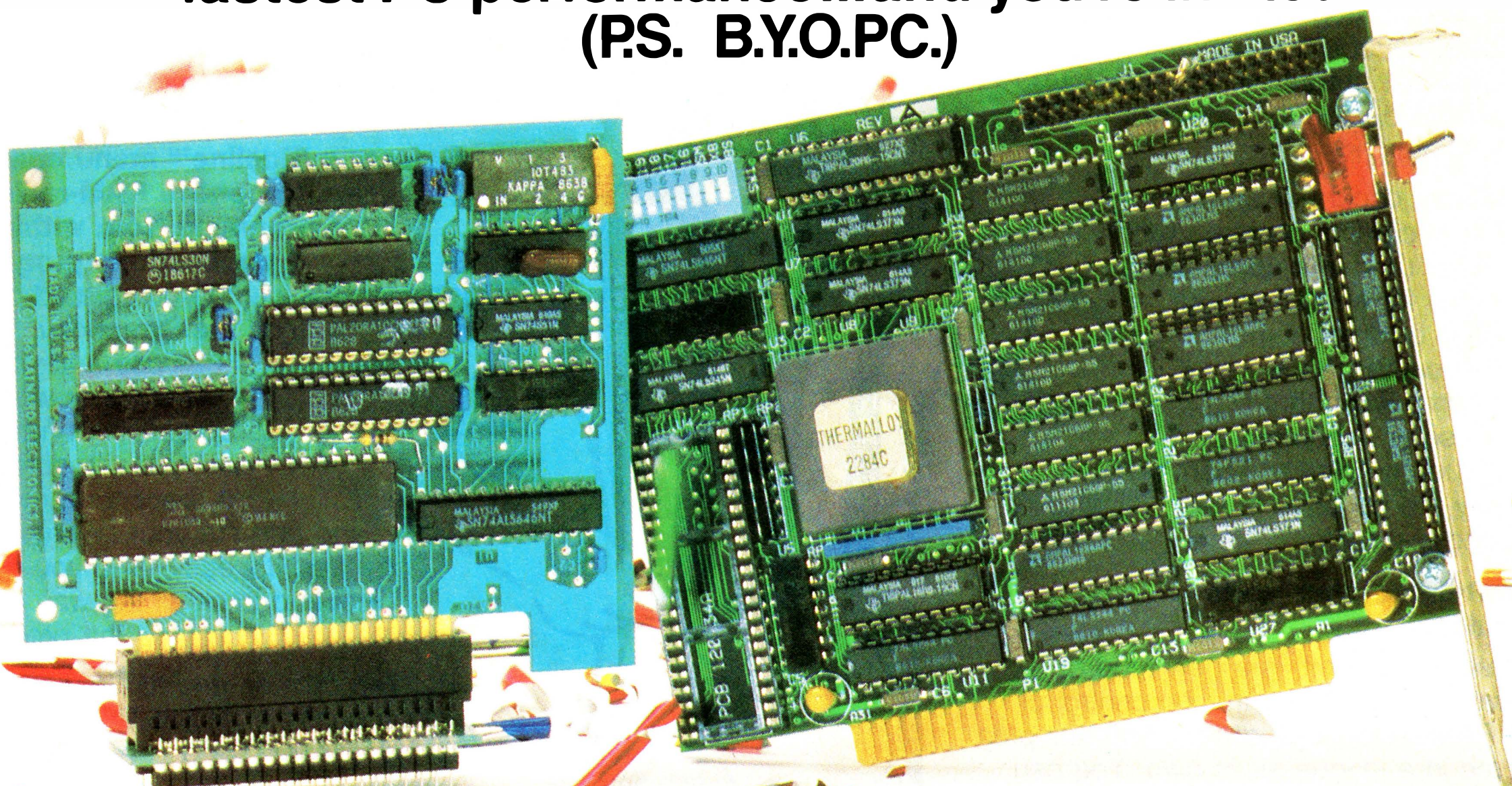
Referee™

persoft®

"...Referee does its job amazingly well—
so well that it's now a permanent addition
to our start-up batch file."
InfoWorld

It's A Surprise Party!

With Maynard's Surprise turbo boards for fast, faster, or fastest PC performance...and you're invited!
(P.S. B.Y.O.P.C.)



Surprise! Turbo Board

Now you can calculate your favorite spreadsheet in a fraction of the time!

- boosts your PC's speed from 30-250%!
- doesn't take up an expansion slot!
- simple keyboard "toggle" command lets you switch between fast and turbo modes for full compatibility with PC software!
- works with the IBM PC and XT, Compaq, and NCR Model 4!
- installs in seconds!

suggested retail price

~~\$249~~

Now
\$149.00

suggested retail price

~~\$599~~

Surprise! 286 Turbo Board

Shift your favorite programs into high gear with lightning, AT-like performance!

- boosts your PC's speed up to 600%!
- fits in a half-slot!
- throw a toggle switch to work in 8088 processing mode or enter a simple keyboard command to jump to one of two 80286 speeds—three options that ensure PC software compatibility!
- socket for 80287 math co-processor!



Maynard Electronics

Shaping tomorrow's technology.

460 E. Semoran Blvd., Casselberry, FL 32707 305/331-6402

IBM, IBM PC, and IBM XT are trademarks of International Business Machines. Compaq is a trademark of Compaq Computer Corporation. NCR is a trademark of NCR Corporation.

R.S.V.P. your local authorized dealer.

(For More Information Circle 26)

PRODUCT REVIEWS

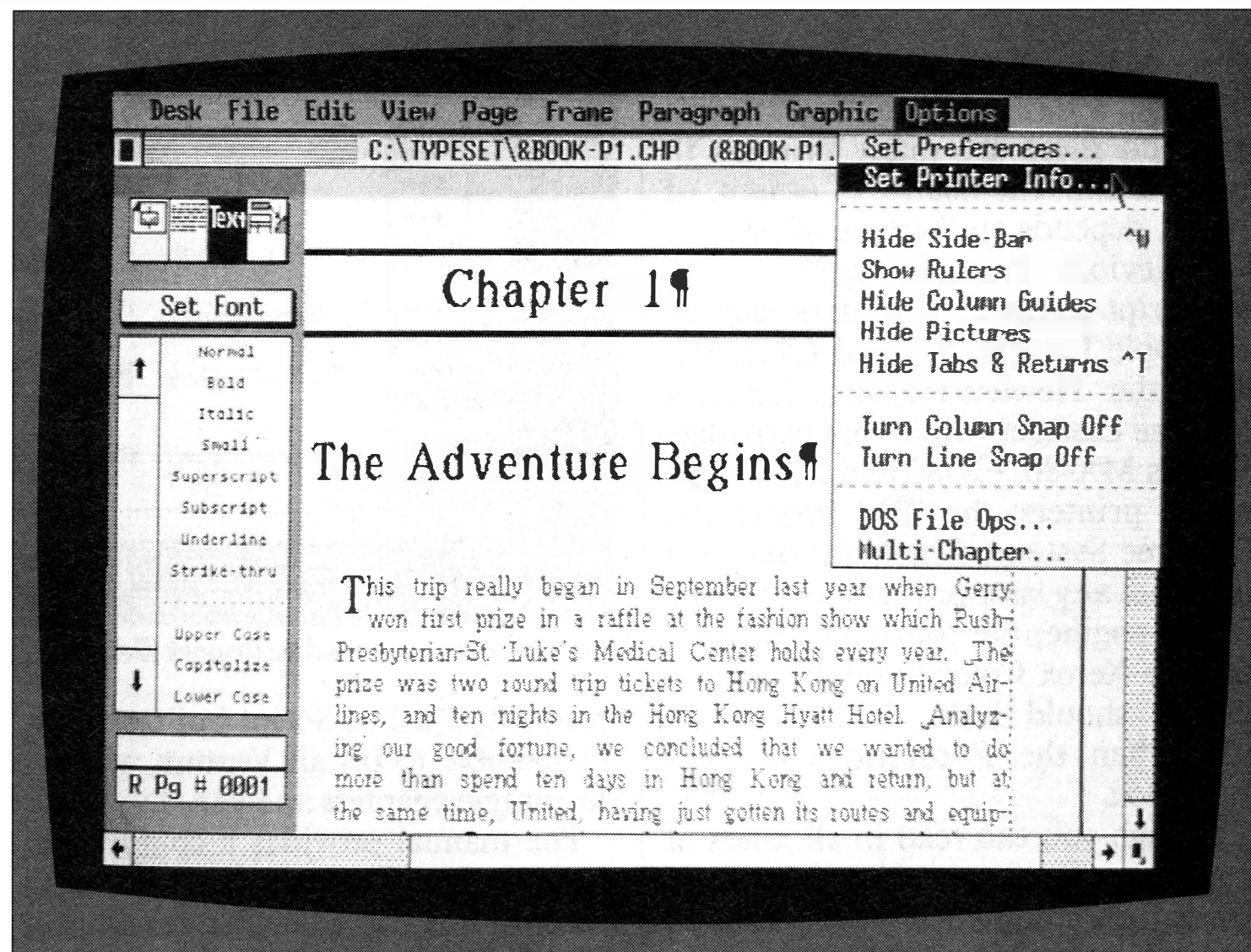
A critical look at the latest computer hardware and software.

Putting It All Together With Ventura Publisher

VENTURA PUBLISHER is a desktop publishing program for the IBM XT, AT, or compatibles; it requires at least 512k (640k is recommended when creating chapters of more than 20 pages), a graphics adapter, and a mouse; the program's 11 disks are non-copy-protected; \$895 retail, Xerox Corp., Business Systems Group, Post Office Box 117513, Carrollton, TX 75011-9990; (800) 822-8221. (For more information, circle 257 on the Free Information Card.)

Before there was desktop publishing, there was word processing. The developers of Ventura Publisher, recognizing that most users feel more comfortable doing text entry and revisions in their favorite word processor, made Ventura very accommodating to those users. This sprawling program's most valuable unsung feature may actually be its ability to import and export files to WordPerfect, MultiMate, WordStar, Word, and ASCII with print enhancements (such as underlining and boldfacing) intact. The formatting of margins, headers and footers, columns, font changes, and text merged with graphics is accomplished through style sheets available in Ventura. Print enhancements such as boldfacing and underlining can be created either in your word processor or in Ventura.

So, for example, WordStar's Ctrl-PS codes translate to underlining in Ventura, and underlining done in Ventura will translate back to Ctrl-PS if you decide to go back to WordStar to do some heavy editing. Ventura has a limited word processor built in (search and replace are not available, for example, but you can readily make insertions, delete characters, or cut and paste text). The one thing that may take getting used to while in edit mode, though, is that you are looking at a graphics-based word processor. Characters are proportionally processed as you type: As you add characters, the other characters on the



Pull-down menus, scroll bars, and real-size headlines are some of Ventura's features.

line crowd together; as you delete, they spread out. There are dramatic differences on the screen between the i's and w's, not something you see with the monospacing of a character-based word processor. Surprisingly, though, the speed at which Ventura reforms lines is barely a beat behind that of most word processors.

Even if a particular word processor isn't listed in the dialog box for loading a file, Ventura recognizes ASCII characters (letters and numbers without control codes or graphics). You can save your file as ASCII in most word processors, then insert the formatting when you load the file into Ventura. Ventura also recognizes certain ASCII character groups as formatting commands; for example, signifies that text to follow is to be boldfaced and <u> signifies underlined. The symbol <d> returns text to its default typeface. So, if your word processor is not supported by Ventura, before you convert to ASCII, you might want to search and replace that program's normal codes with the ones that will be recognized by Ventura. (Release 1.1, due at the end of March, will recognize DisplayWrite and XyWrite formats and address DDL and In-

terpress, page description languages.)

Even without taking advantage of its fancy formatting features, you could use Ventura as a word processing conversion program. You could, for example, import a MultiMate file and export it as a WordPerfect file. Keep in mind, however, that there are much less expensive utility programs that do this already, and Ventura's real value resides in its ability to lay out multiple pages, quickly reform text when changes are made, and drive a battery of expensive laser printers.

I had turned off hyphenation and justification as defaults in my own word processor years ago, because hyphenation decisions slow down formatting, and the page didn't look all that much better with the nonproportional daisy-wheel available. Thus, there was a certain thrill watching Ventura import a document and flash the message "hyphenating" on the screen. A three-page memo written in WordStar took approximately 30 seconds to hyphenate and adjust to the designated Ventura style sheet. Characters were proportionally spaced across the page, and the right margin was justified and properly hyphenated. It looked typeset.

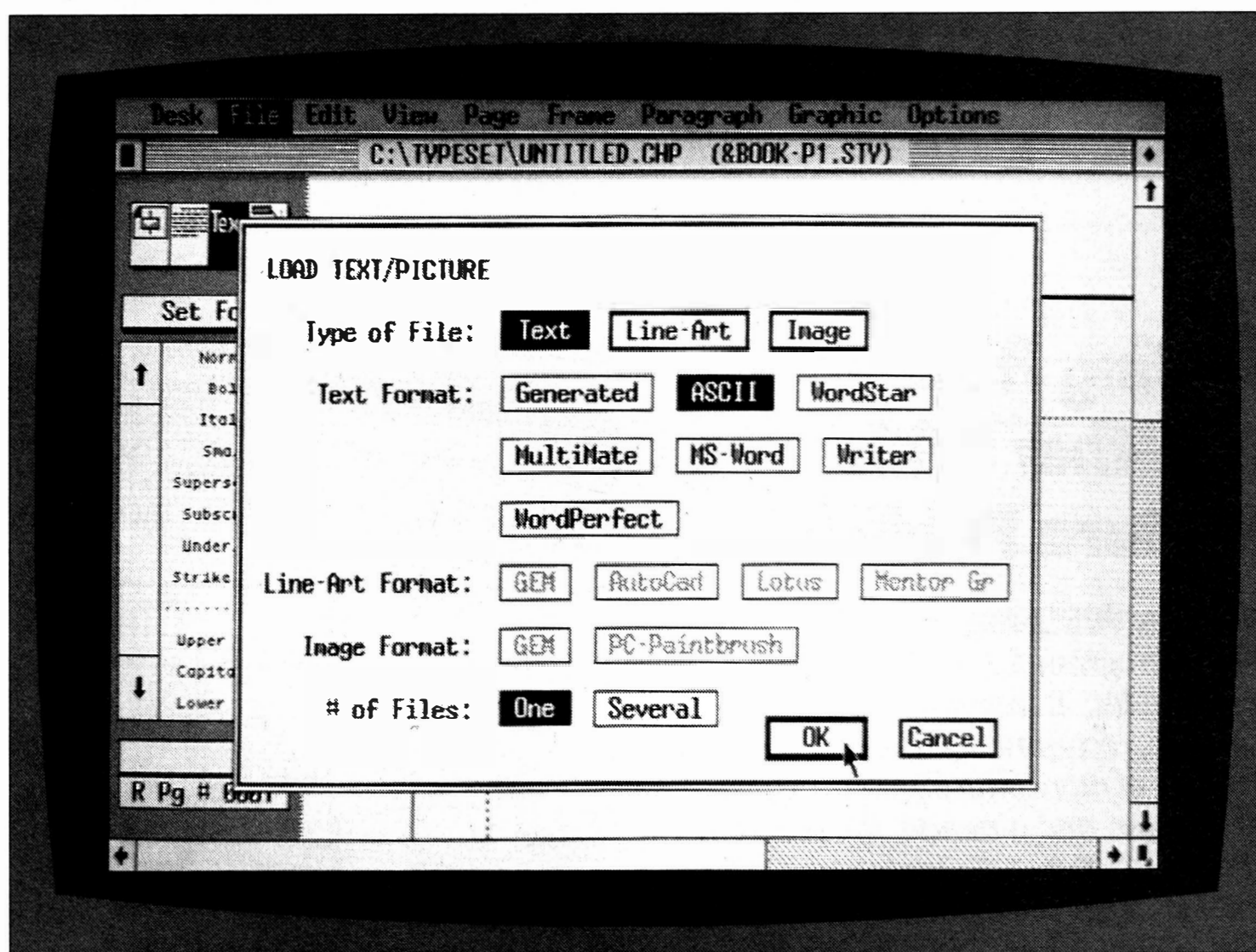
PRODUCT REVIEWS

Since Ventura includes many style templates, you can pick from designs meant for invoice forms, magazines, newsletters, books, technical manuals, letters, or reports—or even design one to your own liking. A style sheet is saved separately and can be applied to any new file you might load in the future.

Even before all the elements are right on the screen, it's tempting to print out. And there are many printers to choose from. The quality of output, of course, depends on the type of printer. The devices Ventura supports are: PostScript-compatible printers (such as the Apple LaserWriter and QMS PS-800); the Hewlett-Packard LaserJet Plus; the LaserJet with F font cartridge; Epson's MX-80, FX-80 and RX-80 dot matrix printers; the IBM Proprinter; Tall Tree Systems J Laser printer card used with any laser printer containing a Canon engine; the Xerox 4045 Laser; and the Xerox Color Ink Jet. LaserJet owners should note that cartridges other than the F cartridge are not supported.

Though you can read in all kinds of graphics and picture files (and have words then automatically wrap around them), Ventura does not capture images from a scanner. We had to first install Z-Soft's PC PaintBrush, for example, to capture images from a Canon scanner and store them as picture files before bringing them into Ventura. Lotus 1-2-3 graphs can be imported.

Ventura's installation can easily take an hour. (Add more time if you first need to install a mouse.) Though you won't have to study the manual to install the program, the 11 disks have to be swapped in and out of your floppy drive according to the menu choices for copying to the hard disk. Then, if you have opted for four different printer drivers as we did (PostScript, J Laser, LaserJet Plus, and the Xerox 4045), you'll sit and twiddle your thumbs for half an hour while your hard disk's drive light goes on and off and the message on the screen says "Expanding Fonts." Fonts are stored on the program's floppies in compressed form, and they must be decoded before your computer can use them. By the time installation was done, about 3Mb of an IBM AT's hard disk was filled. Typically, though, one laser printer and perhaps a dot matrix printer will suffice, shortening installation time and using up less hard disk space. This is not a program for a dual-floppy system, though with a 1.2Mb



The dialog box is used to import files from word processors and graphics programs.

floppy and a PostScript-built printer, it's possible to install Ventura without the sample chapters and run it.

The manual provides a comprehensive overview of the program's powerful features. It is also a tangible example of what Ventura can do: Its several hundred pages (most of which are illustrated with screen menus and dialog boxes) were formatted, laid out, indexed, and printed using Ventura. Decked out with headlines, subheads, borders, italics, and pointing hands, it is profusely illustrated with the program's Macintosh-inspired screens. (A run-time version of GEM, Digital Research Inc.'s graphics-based operating environment, is built into Ventura. A different version of Ventura is expected later this year that will work with Windows, the Microsoft operating environment.)

Anyone familiar with the Macintosh should have no trouble using Ventura, although for people who work only with a keyboard, the relation between the mouse on your desk and what's happening on the screen does take getting used to. For such mouse novices, menus may pull down when you don't want them to, and certain commands won't be operational until you have first clicked on a different mode on the side panel. With practice, though, mouse maneuvering becomes second nature. And the mouse is useful when placing or scaling pictures.

Ventura, at \$895, is \$200 more than other popular desktop publishing pro-

grams for IBM compatibles, including PC PageMaker from Aldus, FrontPage from Studio Software, and Harvard Professional Publisher from Software Publishing Corp. The real choice, however, may come down to a decision between any MS-DOS-based desktop publishing system and the Apple Macintosh with the LaserWriter. In two years, the Mac-based system has developed a well-deserved niche as a dedicated publishing unit. It doesn't require you to fuss with making CONFIG.SYS files or installing a mouse. And one advantage we think the MS-DOS world offers, color, is only partially supported with Ventura. Though we were using an EGA display, Ventura only shows the inferior CGA-level resolution. We chose to run the program in monochrome instead.

Choosing Ventura over a Mac-based system is a decision based upon where your company is coming from as well as where it is headed. Word processing files from the IBM world can be transferred into Ventura from the same computer; with the Mac they would have to be transferred via a communications link, or a special board and software installed in an IBM compatible to process MS-DOS files. However, if such a link already exists, or if there's no problem working in a dedicated Mac environment, it's hard to ignore the well-integrated solution that the Mac offers. Nevertheless, Ventura makes a strong case for doing desktop publishing in an IBM compatible world.

—Michael Antonoff



Problem: Mysterious Data Loss

Solution: New Verbatim DataHold Protects when Static Strikes.

Static Danger is Everywhere. Your data is vulnerable to loss from an unseen enemy—static electricity! Even small static charges could cause sudden mysterious data loss from your diskette.

And static lurks everywhere. Just walk across a carpeted floor and you build up a static charge of up to 1,500 volts—enough to ZAP your data.

It's DataHold or Data Loss. DataHold is Verbatim's ingenious diskette liner that disperses damaging static charges instantly. Compare DataLife to other popular brands which retain static charges up to four minutes and your choice should be obvious.

DataHold, available exclusively from Verbatim DataLife, for unsurpassed data protection. After all, it's your choice, DataHold or data loss.



Verbatim®
A Kodak Company

Verbatim • 1200 W.T. Harris Blvd. • Charlotte, N.C. 28213 • 800-538-1793

(For More Information Circle 57)

Departmental Laser

TEXAS INSTRUMENTS OMNILASER 2015

is a laser printer designed for moderately high volume output. It comes with two paper bins, resident Courier type in three sizes, two cartridge slots for extra fonts as well as printer emulation, 16-line LCD display, and 512k RAM; \$5,995 retail; Texas Instruments, Inc., Data Systems Group, PO Box 809063, H-860, Dallas, TX 75080-9063; (800) 527-3500. (For more information, circle 262 on the Free Information card.)

The first desktop laser printers were so well received by users that many people overlooked the fact that those machines really weren't designed for volume production—they could handle a modest few thousand pages per month and turn out an estimated total of 100,000 copies before parts of the mechanism had to be replaced. At first, no one was counting. But as interest continued to grow—spurred on by the emerging field of desktop publishing—it became clear that sharing lasers was the way to go, to limit costs. Unfortunately, such use pushed the units beyond their design limits.

The situation was made to order for the development of new products, and Texas Instruments is one of the first into the breach with the OmniLaser 2015. The unit prints up to 15 pages per

minute (ppm), nearly twice as fast as the 8-ppm Apple LaserWriter or Hewlett-Packard LaserJet. Just as important, it is designed to handle up to 25,000 pages per month for a total output of 1.5 million copies over its expected life span.

At the core of the product is the Ricoh laser print engine, a product that significantly improves on the Canon engine used in the LaserWriter and LaserJet, among others (though Canon has now redesigned its own laser engine).

Another feature that is deficient in many lasers is paper handling. Because of their fairly high cost, laser printers are a natural for the so-called shared resource environment, where several people share a single peripheral. Such an arrangement often produces lots of paper, sometimes prodigious amounts. The OmniLaser has two paper trays, which can be either standard or legal size. The trays, which hold 250 sheets each, can be selected from the printer's front panel. In addition, the OmniLaser ejects copies face down so that numbered pages stack up in order.

The panel itself has a 16-character display that shows information on the printer—available fonts, printer emulation selected, and ready status. There are also nine symbols above the LCD to provide additional information. The touch-sensitive keys on the panel control the printer options. The panel is well designed, providing more informa-

tion and control than most laser printers. The lighted symbols, however, would be more useful with the addition of a printed description, perhaps available on a pullout card. They are defined in the manual, but since several of the symbols look similar, it's hard to avoid thumbing through the manual repeatedly. We taped a copy of the appropriate page in the manual to the printer.

The dip switches are at the back of the printer next to the parallel and serial ports. Switches are often a sore point for printer users. At first, the OmniLaser switches, too, seemed intimidating. There are twelve of them on the back of the unit, plus four internal ones. Then we discovered that invoking "test" on the front panel prints out a complete rundown of the switches, including a description of the currently selected switch options. This test sheet—which also shows resident fonts and printer emulations—plus available RAM and tray size, is a real timesaver. It alerted us to the fact that we had incorrectly selected the serial port rather than the parallel one.

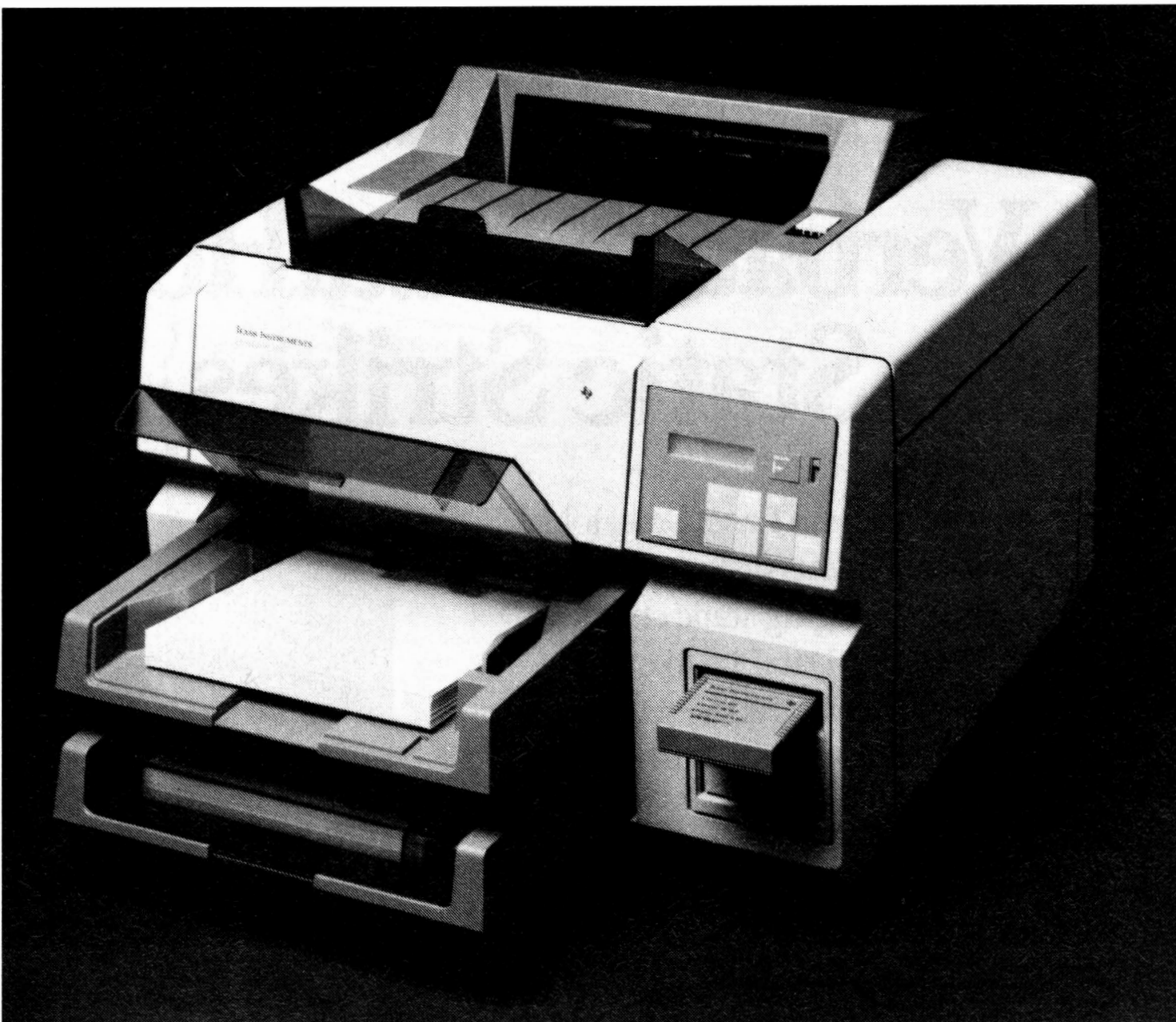
These features don't come cheaply. The OmniLaser retails for \$5,995. At this price, the machine is definitely for the business environment, and Texas Instruments plans to sell it primarily through retailers specializing in corporate sales or directly to data processing departments within large companies.

Texas Instruments offers two other machines with better graphics capability. The top-of-the-line 2115 has all the features of the 2015 plus more memory and PostScript, the page description language, for \$7,995. The 2108 also has PostScript but only one paper tray, and a lower-volume 8-ppm laser engine for \$5,995. The 2015, by contrast, is intended for a high-volume word processing environment requiring only limited graphics (like bar and pie charts).

Advanced graphics may not be required by a given department when it purchases a laser, though they may be later. Unfortunately, the 2015 has no provision for either memory upgrade or the addition of PostScript, a serious design limitation. Representatives of TI did say that might be available in the future. Until then, the 2015 printer is an excellent choice for high-volume word processing, but only if there is little need for extensive graphics or font selection.

—John Blackford

(More reviews page 147)



The OmniLaser 2015's two 250-sheet input bins enhance paper handling.

Attention Lotus users: Write easier, write faster. Right in 1-2-3.

Lotus users must be the most loyal, most patient people in the world . . . so many of you continue to use 1-2-3 for writing memos and reports. You tap the / Range Justify command to rearrange text. Your [F2] edit key is worn an eighth of an inch shorter than the rest. It's not pretty, but it works. Well, your patience just paid off. Introducing 4WORD, The Add-In Word Processor™ for 1-2-3. If you've ever written a memo using Lotus, you're going to love it.

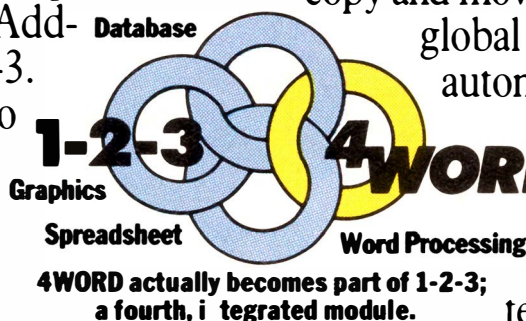
Complete Word Processing. Built-In.

4WORD is unlike anything you've seen. It's not a macro. It's not even a stand-alone Lotus add-on. 4WORD is full-featured word processing software that integrates into 1-2-3 itself. It's one of the first products available that uses the new Advanced Add-In technology from Lotus. So it actually functions as part of 1-2-3 (the way word processing works inside Symphony). That means when you want to write a memo, just shift into 4WORD with a single keystroke. Right in the middle of your spreadsheet. You never have to stop, store and exit 1-2-3 again.

4WORD, just move the cursor to an unused column, press a key and you're there. Now you can type away. With features of the most powerful word processors.

Better letters. On-screen.

4WORD gives you automatic word wrap with on-screen justification. Block copy and move. Bold, italics, underline, global search and replace, tabs, automatic re-align, margins, and more. All right on your screen. All without leaving 1-2-3. You can even create sophisticated form letters, and merge them with the spreadsheet's database. Automatically. Then print with the 1-2-3 /Print command. And, the whole process can be controlled by a 1-2-3 macro.



Imagine: You're running a "what-if" budget analysis in 1-2-3 and you come up with a better solution. Quick, fire off a memo to your department manager before you lose your train of thought. Without 4WORD you'd have to save your spreadsheet, exit 1-2-3 and load a word processor. With

Now let's talk integration. Imagine the memo again. And imagine this: To demonstrate your solution, you need to include spreadsheet numbers. Can 4WORD do that? You bet. Just tap / Integrate (that's a new 4WORD command), move the cursor across the range of numbers and zap. Your memo is connected to your spreadsheet. And the numbers appear in the memo right where you want them. If you change numbers in the spreadsheet, the memo changes too. We call this "hot links." And the first time you write a report with tables, exhibits and appendices linked to 1-2-3 spreadsheets, you'll understand why.

Think of 4WORD as a easy-to-use companion to 1-2-3. It's the kind of product you've come to expect from Turner Hall, publishers of Note-It and SQZ!. 4WORD won't replace your stand-alone word processor . . . it's really not meant to. But for only \$99.95, it's one heck of a spreadsheet addition.

Specifications:

- Not copy-protected.
- Requires PC/MS-DOS 2.0 or later and an IBM PC version of Lotus 1-2-3 Release 2.0 or later.
- Compatible with EMS boards and programs like Sidekick, SQZ!, Note-It® and HAL.
- Uses only 50K of additional memory.
- Complete on-line, Lotus-like help system.
- Can be controlled by 1-2-3 macros.

The Write Guarantee.

We're so sure you'll love 4WORD, we'll give you this guarantee: try 4WORD for 30 days and if you're not completely satisfied for any reason we'll take it back and send back your money. No questions asked. Call today. Or better yet, right now.

1-800-556-1234 x528
(In CA 800-441-2345 x528)

4WORD

THE ADD-IN WORD PROCESSOR™ FOR 1-2-3

**Only
\$99.95**

*Available at better
dealers everywhere*

 **Turner Hall Publishing**

A division of Symantec

10201 Torre Ave., Cupertino, CA 95014 • (408) 253-9607

SQZ! and 4WORD The Add-In Word Processor are trademarks and Note-It is a registered trademark of Turner Hall Publishing. Lotus, Symphony, HAL and 1-2-3 are registered trademarks or Lotus Development Corp. Other brand and product names are trademarks of their respective holders.

(For More Information Circle 66)

Please send me _____ copies of 4WORD for \$99.95, plus \$2.00 per unit shipping. (\$12 per unit outside USA). CA residents add \$7.00 sales tax per unit.

☐ I enclose \$ _____
☐ VISA ☐ MasterCard ☐ AMEX ☐ Diners Club

Card # _____ Exp. Date _____

Name _____

Company _____

Address _____

City/State/Zip _____

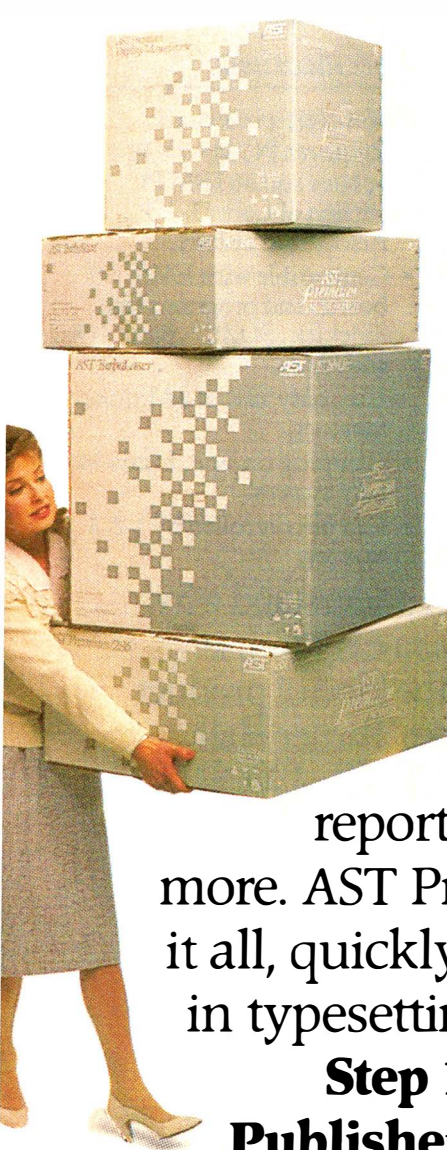
Phone () _____

PER387

 Developed by
LeBlond Software
The Add-In Experts

AST Takes the Mystery Out of Desktop Publishing

COMPATIBLE WITH
VENTURA PUBLISHER™
AND ALDUS PAGEMAKER™



Desktop publishing is easier than you think. In fact, unpacking the AST Premium Publisher™ complete desktop publishing system leaves only five more steps to professional-looking presentations, business forms, newsletters, reports, complicated manuals, and more. AST Premium Publisher lets you do it all, quickly, with no previous experience in typesetting or printing.

Step 1. Plug in your Premium

Publisher. Everything you need to start publishing is preconfigured by AST. At the heart is the AST Premium/286™ AT®-compatible personal computer. With powerful 10 MHz processing speed and true zero wait-state operation you can run your favorite IBM®-compatible software up to 50 percent faster than the 8 MHz PC AT.

Step 2. Enter text with your favorite word processing package. Then, use any of the



popular desktop publishing packages to select layout options, such as column width and line spacing, to give your document a professional look. The most popular programs like PageMaker™, FrontPage™, Ventura Publisher™, Halo DPE™ and Pagework™ are specially designed to take full advantage of the Premium Publisher's power and flexibility.

Step 3. Incorporate photographs, technical illustrations, handwriting or printed text into your document using AST TurboScan™.

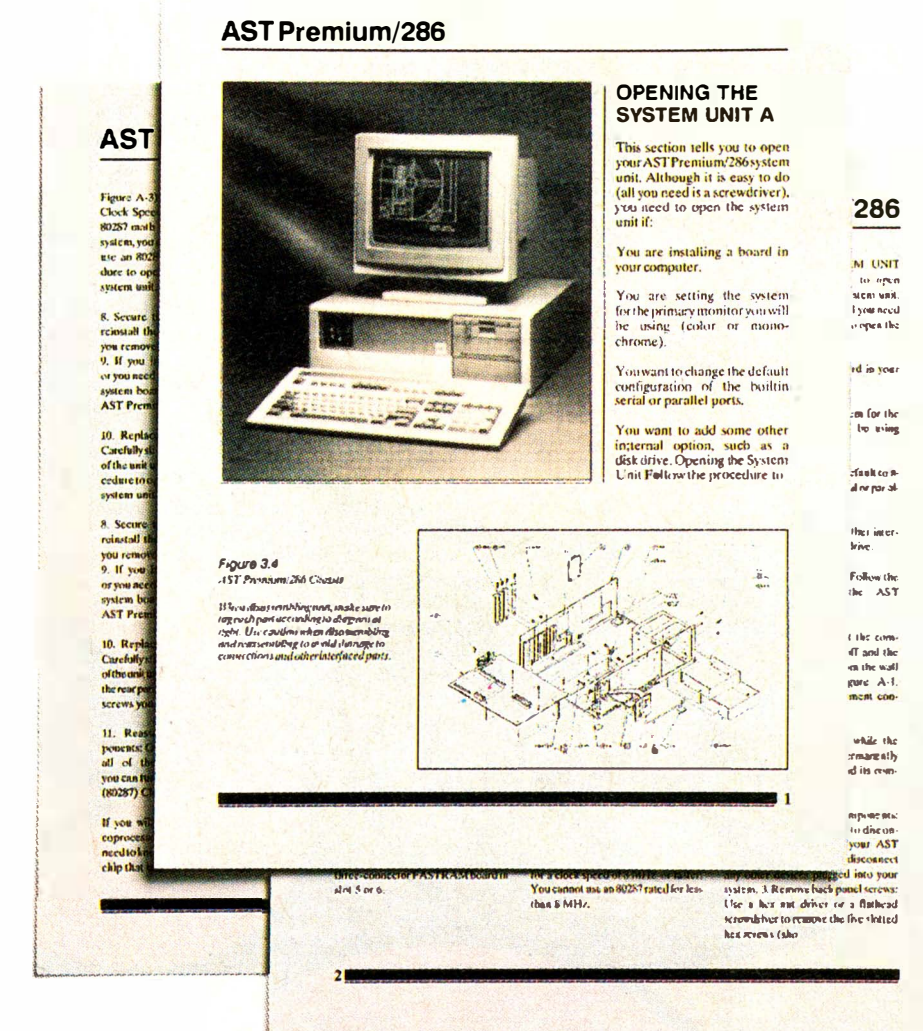
Just feed any half-tone, line art or text rendered on paper into your image scanner. In a matter of seconds, a high-resolution, digitized image appears on your screen. To convert existing documents into text files that can be read and edited using word processing software, AST offers optical character recognition software.

You can also create your own graphics using popular graphics art software including PC Paint™, PC Paint Plus™, PC Paintbrush™ or PC Paintbrush Plus™.

Step 4. Merge text with graphics. Gone are the days of using rubber cement and X-acto® knives to cut and paste together the elements of your final draft. AST Premium Publisher introduces a much easier electronic process of sizing, resizing and shuffling text and graphics.

Step 5. Print your final results with AST TurboLaser™. Producing eight original pages per minute, our compact laser printer gives you bolder headlines, crisp, readable text and precise full-page, 300 dots-per-inch graphics. TurboLaser prints a myriad of type styles and sizes for the look that best suits your application.

Step 6. Turn out the lights. AST Premium



Publisher's extraordinary speed lets you set a new pace for office productivity. Each component is designed to outpace the competition. Plus, the hardware and software compatibility of the totally integrated package insures smooth flowing "start-to-finish" production.

For the fastest, most complete and easy-to-use desktop publishing system on the market today, discover AST Premium Publisher.

For more information, call our Product Information Center **(714) 863-0181**. Or send the

coupon to: AST Research, Inc., 2121 Alton Avenue, Irvine, CA 92714-4992. Attn: M.C.

AST markets products worldwide—in Europe call 44 1 568 4350; in the Far East call 852 0499 9113 in Canada call (416) 826-7514. AST and AST logo registered and AST Premium Publisher, AST TurboLaser, AST TurboScan, AST Premium/286 trademarks AST Research, Inc. PageMaker trademark Aldus Corporation. FrontPage trademark Studio Software. Ventura Publisher trademark Ventura Software. Halo DPE trademark Media Cybernetics. Pagework trademark West End Film. IBM and AT registered trademarks International Business Machines. PC Paint and PC Paint Plus trademarks Mouse Systems. PC Paintbrush and PC Paintbrush Plus trademarks ZSoft Corp. X-acto registered trademark of Hunt Manufacturing Co. Copyright © 1987 AST Research, Inc. All rights reserved.

YES! Send me more information today on AST's Premium Publisher.

Name _____

Title _____

Company _____

Address _____

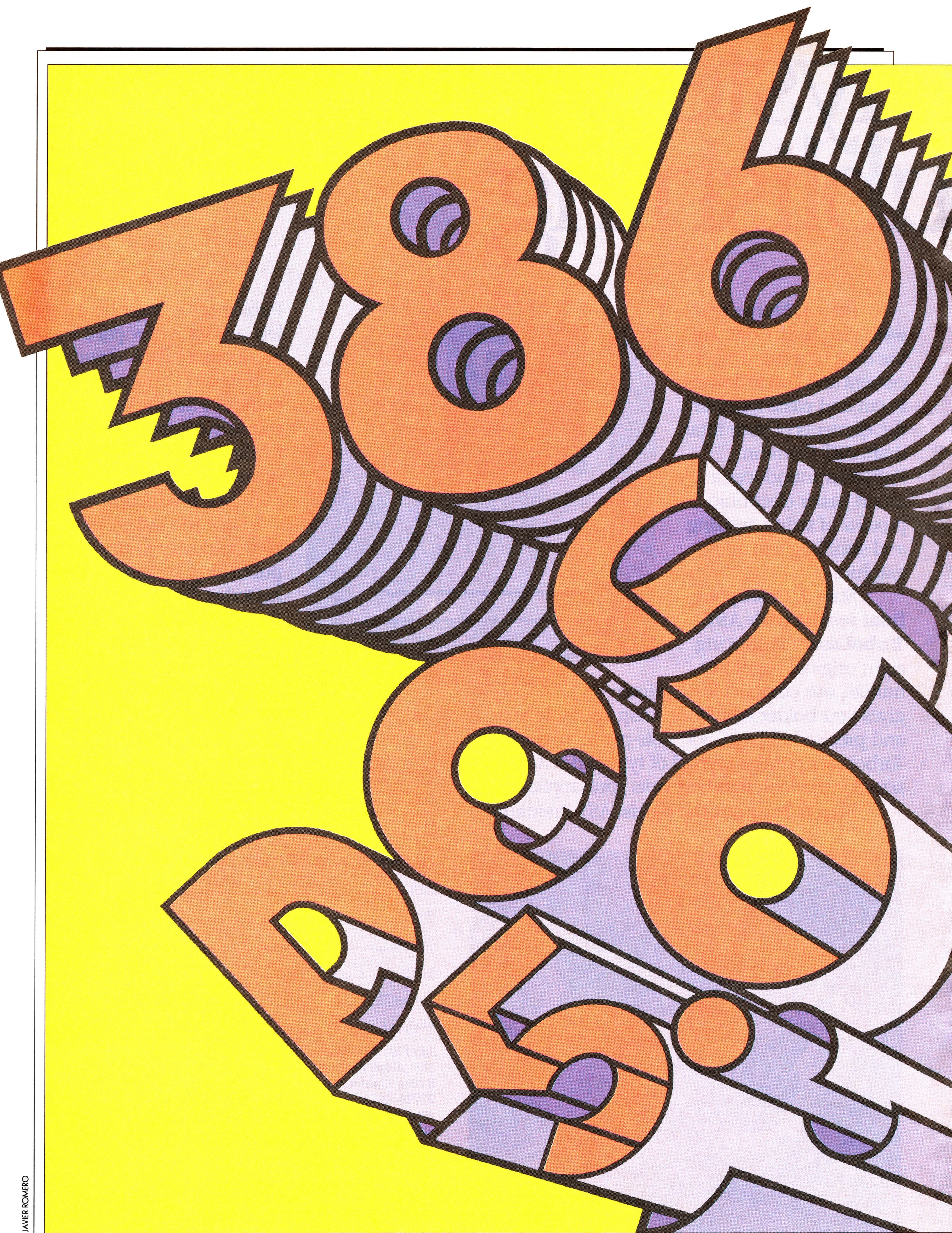
City/State/Zip _____

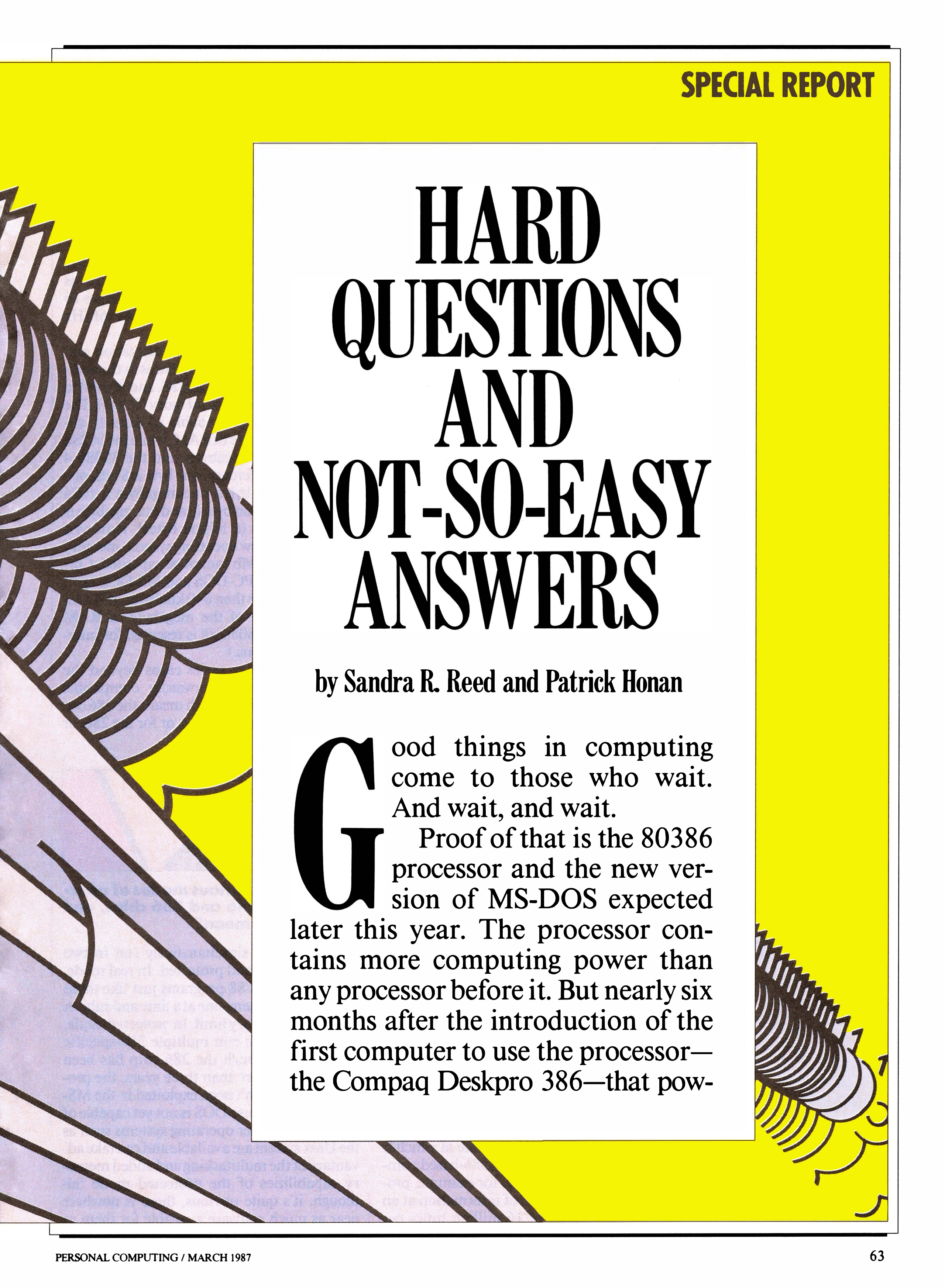
Telephone () _____

Send to: AST Research, Inc.
2121 Alton Avenue
Irvine, California
92714-4922
Attn: M.C.
01PC1085B01PP

AST
RESEARCH INC.







HARD QUESTIONS AND NOT-SO-EASY ANSWERS

by Sandra R. Reed and Patrick Honan

Good things in computing come to those who wait. And wait, and wait.

Proof of that is the 80386 processor and the new version of MS-DOS expected later this year. The processor contains more computing power than any processor before it. But nearly six months after the introduction of the first computer to use the processor—the Compaq Deskpro 386—that pow-

THE 386 CHIP HAS A VIRTUAL- 86 MODE THAT RUNS MULTIPLE 8086/8088 PROGRAMS, WITH EACH PROGRAM SUBJECT TO THE 640k LIMIT.

er has yet to be fully used. The new MS-DOS version will make only 16Mb of RAM available to users for applications. No one knows when a DOS will be available to take advantage of the even greater abilities of the 386 processor. Those using the current MS-DOS gain faster operation but nothing more, although the latest DOS operating environments do tap some of the 386's power.

As is typical in the computer industry, glowing reports about a new product category have stimulated interest that won't be satisfied for some time. The 386-super may be shipping, but the DOS for it could be a couple of years away. In addition, the diverging interests of the various manufacturers involved have led to statements that don't always clarify the issues for potential users of the new systems. Some of them are trying to trumpet some feature they plan to offer, while others want to minimize discussion until they have a product ready to ship.

The many statements, counterstatements, and promises concerning the benefits of the 80386 processor and new DOS have caused some confusion. In fact, the experts themselves don't always agree—at least it often sounds as if they don't. Part of the reason is the complexity of the subject; part is the obscure lingo that has sprung up to describe concepts like protected mode, direct addressing limits, virtual DOS sessions, and others seemingly pulled from the pages of a textbook on quantum mechanics. Here, then, are hard questions and not-so-easy answers about the 386 processor and the new DOS.



How does Intel's 80386 chip differ from the 8086/8088 chips used in the IBM PC and compatibles and from the 80286 used in AT-level computers?

It is faster and considerably more powerful. The 80386 chip is Intel's first 32-bit microprocessor, which means it handles information 32 bits (binary digits) at a time and communicates with hardware, like add-on cards, at 32 bits also. The 8088, which IBM uses in its PC and XT, processes data 16 bits at a time but communicates with hardware, like add-on cards, only 8 bits at a time. The 80286 chip both processes data and communicates with hardware 16 bits at a time.

Another factor contributing to the 80386 chip's faster speed is its higher clock speed. A computer's clock speed is the rate at which it processes bits of data. An 80386-based computer operating at 16MHz, for example, processes the 32-bit chunks of information at an internal clock cycle of 16 million times per

second. The present 80386 chip can be run at 12, 16, or even 20MHz, and a version reliable up to 24MHz is on the horizon. The 80286 chip functions at clock speeds between 6 and 16MHz, but most manufacturers of 80286 computers design them to run at either 6 or 8MHz. The 8088 chip typically runs at 4.77MHz, though 8MHz turbo options are becoming common. Many makers of PC compatibles use the 8086 chip because it runs as fast as 10MHz and, more important, is a full 16-bit CPU. An 80386-based computer operating at 16MHz is handling twice as much data as an IBM PC AT (32 bits versus 16 bits) and processing it twice as fast (16MHz versus 8MHz).

In addition to faster communication and clock speeds, there are differences in the ability of the chips (8086/88, 80286, and 80386) to address random-access memory (RAM). The 8086 and 8088 are capable of directly addressing 1 megabyte of RAM, while the 80286 can address 16 megabytes and the 80386 4 gigabytes. For reference, one byte is 8 bits, one kilobyte is 1024 bytes, one megabyte is 1024 kilobytes (a million bytes), and one gigabyte is 1024 megabytes (a billion bytes). However, until there is a new operating system, memory access beyond 1Mb cannot be exploited. Current versions of PC-DOS and MS-DOS can't directly use more than 640 kilobytes of RAM. (The remainder of the megabyte of RAM available to the 8086/88 is reserved for internal DOS functions.)

All of the 80xxx series chips beyond the 8086/88 contain downwardly compatible modes of operation, which means the 386 can run programs written for it, or for the 286, or for the 8086/88.



What are the various modes of operation of the 286 and 386 chips, and what do they mean?

The 286 can simultaneously run in two modes, real and protected. In real mode, it runs 8086/88 programs just like those processors run them, one at a time and subject to the 640k memory limit. In protected mode, the 286 chip can run multiple 286-specific programs. Although the 286 chip has been available for more than three years, the protected mode hasn't been exploited in the MS-DOS world because DOS is not yet capable of using it. Multiuser operating systems such as the Unix system are available and can take advantage of the multitasking and added memory capabilities of the protected mode (although, it's quite obvious, there is nowhere near as much software available for them as

there is for MS- or PC- DOS).

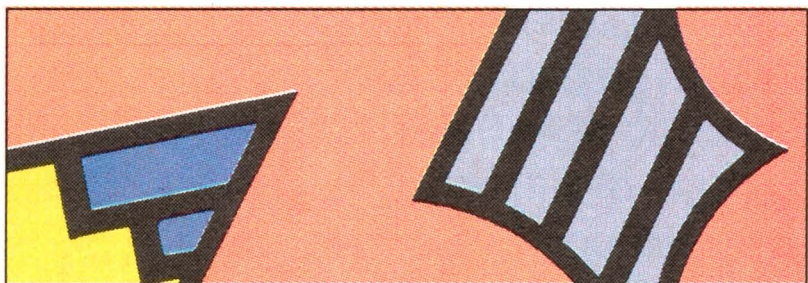
The 386 chip is actually a superset of the 286 with added capabilities. Its real mode performs just like the real mode in the 286. It also has what is called a virtual-86 mode, able to run multiple 8086/88-generation programs. And it has a protected mode, which serves the same functions as the 286's protected mode. Each of the virtual 8086/88 sessions is subject to the 640k limit. But again, these capabilities are not available to DOS 2.0 or 3.0. However, some software developers, like Quarterdeck with its Desqview, have created operating environments that tap the 386's virtual (but not protected) mode. The 386 is also capable of simultaneously running multiple 286-protected mode programs and multiple 386-generation programs—but only with a multiuser operating system such as Unix, or with new versions of DOS when they are available.



What is DOS 5.0?

It is the operating system, expected sometime this year from Microsoft, that will take advantage of the protected mode of 80286-based computers. In addition to being called DOS 5.0, it is often known as 286DOS, or more often, ADOS (Advanced DOS).

The 286 running ADOS can address 16Mb of RAM, in contrast to the 1Mb (640k available to RAM) the 8086 and 8088 processors address running current DOS versions like 2.0 or 3.0. But the 286 running such versions is subject to the same 640k limitation as an 8088 CPU. Only with ADOS will the advanced modes built into the 286 chip become available—and then only when new applications are written specifically for the new DOS to take advantage of the extra memory available and the so-called protected mode, which allows multitasking. It is also expected that the new DOS (ADOS) will remove the current 32Mb limit to hard disk size.



What's the status of the ADOS operating system? When will we see it?

Microsoft says it will release a new DOS in 1987, but exactly when is not clear. Preliminary (beta) copies have been in the hands of some software developers for as long as two years, but few people know exactly

386 BUYING SPREE

At the accounting firm of Coopers & Lybrand, the question isn't whether to buy 80386-based personal computers—the key issue is how many the company should buy.

The first shipment of Compaq Deskpro 386s arrived in time for use in the firm's tax preparation undertakings, that annual ritual that accountants (and taxpayers) love to hate. The computers were added to the buying lists at Coopers & Lybrand's more than 100 offices nationwide after extensive testing at the firm's office of Advanced Information Technology Planning (AITP) in Dallas, Texas. It took the 386s through their paces in an attempt to identify how Coopers & Lybrand and its customers might use the systems.

Dave Landry, a Dallas-based office automation expert, says the AITP group office identified three major applications categories in which 386-based machines excel: as network file servers, for programming the company's customized tax software, and in specialized applications.

Even though the Compaqs were added to the firm's approved buy list, Landry remains skeptical that a 386-based machine has a place on every desk. He estimates that during the next two or three years, 386-based systems will constitute less than 10 percent of the firm's PCs.

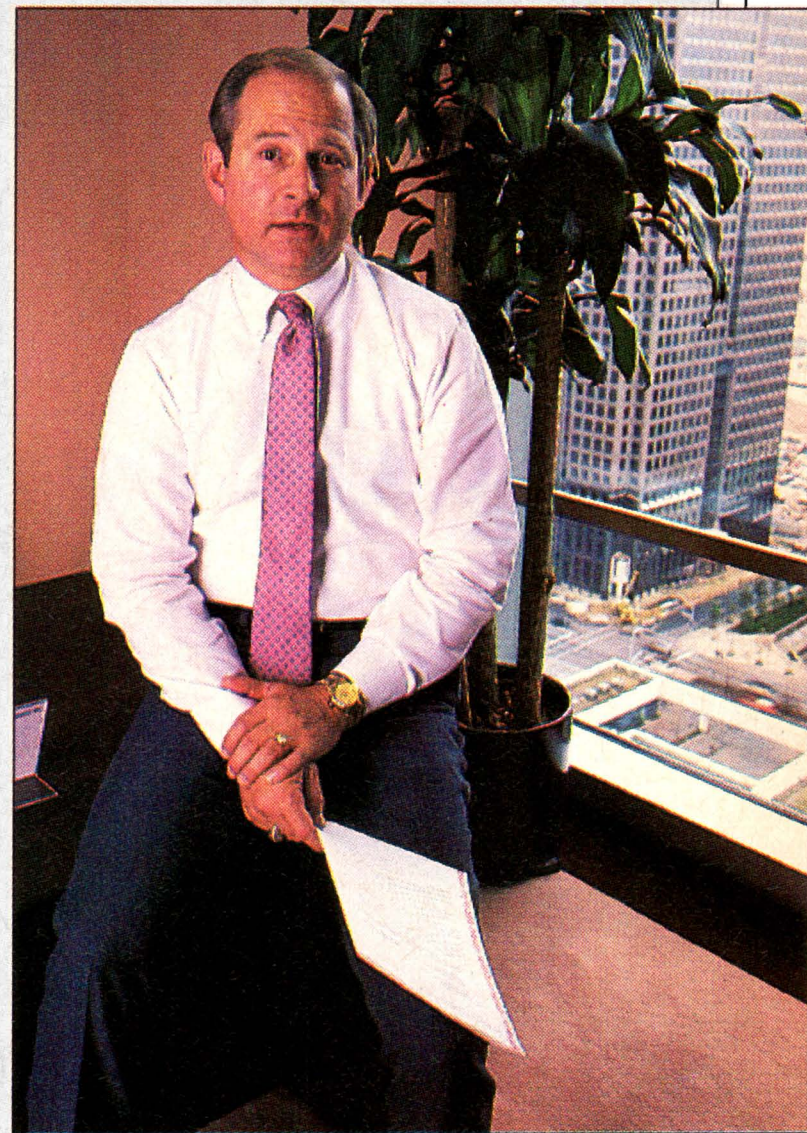
At present, Coopers & Lybrand owns several thousand personal computers, most of which use the IBM software architecture (MS/PC-DOS). Like many other companies, the accounting firm has begun to standardize on 80286-based machines that can run software written for the IBM PC AT, leaving 8088-based PC-compatibles to languish.

During the course of its assessment of the newest generation of hardware, Landry's office considered a number of factors, including speed and software compatibility with existing applications. Even though an advanced operating system was factored into the equation, it wasn't a major consideration, he says. Neither was speculation about the architecture of IBM's much-anticipated 386 machine.

Were it overly concerned with operating systems, in fact, Coopers & Lybrand wouldn't be migrating toward 80286 machines, since Microsoft has yet to release a DOS to take advantage of that chip's advanced capabilities. As Landry says: "We're two and a half years into AT hardware without the opportunity to exploit it." Even when a 286DOS is finally released, applications software that exploits its ability to address more RAM directly will continue to lag. The same lag no doubt will occur between the release of a 386 DOS and accompanying software.

Rather than worry about the future of operating systems, then, Coopers & Lybrand centers its concern on how a machine can be used *now*. "We don't concern ourselves with the fact that the 286 can theoretically do more [than 8088-based machines]," says Landry. "And if we can use 386 machines over the next two or three years, that's fine."

—S.R.R.



DAVE LANDRY: DOSes aside, what a new machine does right now is pivotal.

TIM BOOLE



MORE THAN JUST ANOTHER PRETTY FACE.



The Freedom® ONE Plus terminal gives you a good looking, cost effective means of bringing multi-user capabilities to your Personal Computer AT or compatible computer. All for only \$549. It provides full PC character set and display format compatibility with eye opening clarity on a flat 14-inch amber screen.

We've even included the enhanced IBM PC keyboard layout that IBM is standardizing on for future products. What's more, the Freedom ONE Plus emulates many of the most popular ASCII terminals and gives you the choice of alternate keyboard layouts including Wyse WY-50 or DEC VT220 style.

Built by the same people who manufacture Princeton Graphic monitors and workstation products for Harris Lanier, the Freedom ONE Plus is backed by a "no worry" **three year limited warranty** and a nationwide network of Authorized Service Centers.

To see beyond the Freedom ONE Plus's good looks, call us today at (415) 742-7000.



Liberty

We make terminals.

DEC, VT220 are registered trademarks of Digital Equipment Corp.
Wyse is a registered trademark. WY-50 is a trademark of Wyse Technology.
Princeton is a registered trademark of Princeton Graphic Systems.
IBM, Personal Computer AT are registered trademarks of IBM Corporation.
Freedom is a registered trademark of Liberty Electronics, U.S.A.

(For More Information Circle 36)

what it will include. Because of the close relationship between Microsoft, who makes the operating system, and IBM, the new DOS won't be released until IBM approves, which it probably won't do until it has a new computer—perhaps an 80386 machine—to roll out at the same time. Most industry watchers believe ADOS will make its way to market sometime between March and October of this year. But until that time, all versions of Microsoft DOS currently available remain limited to the architecture of the 8086/88 chip for which they were designed. Though IBM might time the release of ADOS to coincide with that of its 386 computer, that operating system is actually designed around the 286 chip, not the 386. It's only because the development cycle of the operating systems is so slow that ADOS is significant to 386-based computers. A 386DOS is not likely to be available for a couple of years after 286DOS. So until then, DOS users will have to make do with ADOS.



What kinds of applications will we see for the new versions of DOS?

When ADOS—and eventually 386DOS—have been around long enough for new programs to work their way to the market, one thing we'll see is some powerful enhancements for individual users. There are already plenty of multiuser computer systems and operating systems around. The difference is that DOS has its roots in the needs of those using a *personal* computer. The raw power, memory addressing, and multiuser capabilities of both the 286 and 386 chips are likely to stimulate whole new categories of productivity tools for individuals—though all we can do now is speculate.

Some possibilities: advanced graphics and cut-and-paste features, allowing managers to produce typeset-quality reports with halftone photos and graphics added in—the next generation of desktop publishing; a complete dictionary and thesaurus on-line at all times, including definitions and tips on word usage; a massive Rolodex and phone dialer on-line; background on clients or industry sources available quickly, whether or not you know exactly what to ask for.

In addition, the 286/386 generation may see use in low-cost CAD/CAM and engineering workstations with the added benefit of MS-DOS compatibility. Artificial intelligence will develop in two directions: one toward stand-alone products, so-called expert systems, that offer diagnosis and suggestions on complex subjects; the other toward ad-

FULL SPEED AHEAD

Based solely on labor savings, Energy Simulation Specialists (ESS) in Tempe, Ariz., long ago recovered the additional cost of buying a Compaq Deskpro 386. Applications that required up to 16 hours to run on an 8MHz IBM PC AT run in three to four hours on the 386, says the company's president, Chuck Sherman. The 386 also is handling some tasks that were previously run on mainframes.

On the basis of the performance of the lone 386 he bought in 1986, Sherman says it's likely that the company's 1987 budget will include provisions for upgrading the company's 80286 users to 386s and 8088 users to 286s. That doesn't mean that Sherman isn't concerned about the ramifications of an advanced operating system designed for the 286 generation of computers. "Even if a new DOS comes out and it doesn't do quite all we want, it just wasn't worth not making that additional step up to a 386," he says.

The company's computing needs are heavily focused in engineering-related areas. ESS works with architects, engineers, and building owners to evaluate energy consumption in large facilities. The company builds models that simulate data over the course of a year, using actual weather information and performing thousands of calculations an hour to estimate annual utility bills. Before acquiring the Compaq Deskpro 386, ESS used a PC AT as a terminal to a mainframe, which performed the calculations. Now, the 386, which is hooked up to a 3Com network along with 10 PC ATs, can handle some of the models. Ultimately, Sherman hopes to avoid using mainframes entirely.

Sherman assessed the specifications of several 386 machines before deciding to buy a Compaq. Even though the manufacturers of other 386 machines promised compatibility with existing applications, his major concern, Sherman had problems with the design philosophy of the other machines he considered. He rejected one because its memory expansion was 16 bits compared to Compaq's 32-bit memory expansion. Another was dropped from the list because it came with a socket for an 80387 numeric coprocessor, which hasn't been released, while the Compaq came with an 80287 math coprocessor. He would have considered an IBM 386 had it existed when he needed it. "I need the speed and power. Whoever gives it to me, that's where I'll go."

The fact that IBM didn't have a 386 available didn't cause Sherman to hesitate. "The way we look at it is, even if they [IBM] do go proprietary, the only way they could hurt us is with a proprietary operating system," Sherman says. "Even if that's the case, we'll at least get AT functionality out of the Compaq. We're willing to take that chance." Sherman believes IBM would be foolish to stray too far from the installed MS-DOS base. He also is confident that DOS developer Microsoft will continue to support "the Compaq environment."

—S.R.R.



CHUCK SHERMAN: Using 386s instead of mainframes is the ultimate goal.

TOM IVEY

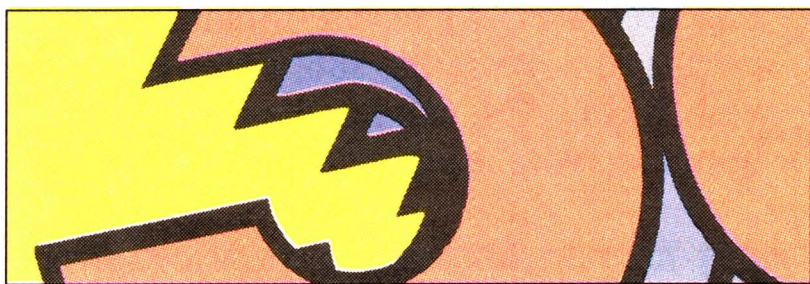
**MOST SOFTWARE
WRITTEN FOR THE
NEW DOS WILL
NOT BEGIN TO
APPEAR TILL
SIX MONTHS OR A
YEAR AFTER
THE NEW DOS IS
AVAILABLE.**

vanced help functions within a given program. If you are learning a new program, these latter functions would give it an uncanny ability to predict your intentions and show you how to accomplish them in the program. Alongside such developments, the power and multitasking ability of 286/386 computers will accelerate the trend toward vast networked computer systems, perhaps hastening the day when all "personal" computers are part of a single extended network sharing data base, processing, and telecommunications resources.



How soon after the new DOS is released will programs designed for it start reaching the market?

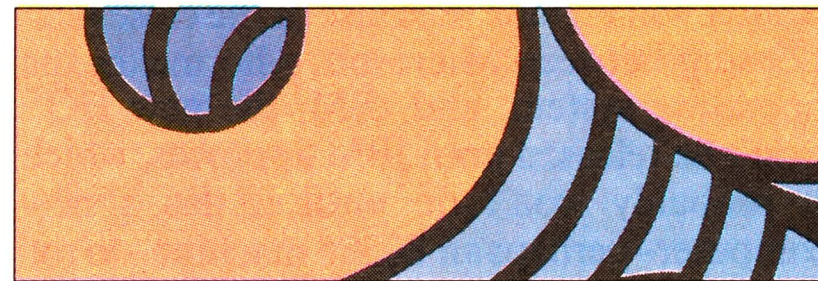
Some could be announced simultaneously, largely by companies that Microsoft and IBM are permitting to work with prerelease versions of the new DOS. Microsoft will probably have new versions of its application packages—such as Word and Chart—ready when ADOS is announced. But the majority of software that takes advantage of the new DOS probably won't begin arriving until six months or a year after Microsoft releases ADOS. Programs that will take the most advantage of ADOS, such as sophisticated artificial intelligence and CAD packages, will likely take the most time to develop.



If we won't see 386DOS for a couple of years, then why the fuss about 386-based computers?

There are a number of reasons, but the most important seems to be that the 386 processor has a potential no other processor for a personal computer has ever had before. Because of its 32-bit architecture, ability to use four gigabytes of memory, advanced multitasking capability, and DOS compatibility, 386-based computers have tremendous potential as stand-alone systems, as graphics workstations, and as servers for multiuser systems.

The capabilities of the 386 processor will also enable software developers to create programs that are vastly more powerful, yet easier to use. In fact, 386 PCs may reduce the role of mainframes in data processing.



How well will ADOS work with the 386 processor?

It will work fine, but will only address 16Mb rather than the four gigabytes the 386 processor's protected mode can address. That is because the new DOS will run in the 286 protected mode, which is a portion of the 386 protected mode. Thus ADOS will retain the limitations of the 286 chip even when running on a 386-based computer. This is analogous to 1Mb memory limitations imposed by DOS 3.0 when running on a 286.

The four-gigabyte limit and multitasking ability of the 386 protected mode cannot be used until a DOS version and new applications have been written specifically for the 386 protected mode.



What about the new protected mode of the 286—will software written for that under ADOS be compatible with 386-based computers?

Absolutely, says Dana Krelle, Intel's marketing manager for advanced processors. "The 386 protected mode is a proper superset of the 286 protected mode," he says. "Anything in 286 protected mode will run in the 386 protected mode in the identical fashion." It's just that ADOS can't take full advantage of the 386 chip.

At least that's the theory. Since ADOS is not released yet, we'll have to reserve judgment about possible exceptions, bugs, and other reasons why ADOS might not be as perfect a fit on 386 machines as it will be on the 286 ones for which it is designed.



Are there any problems running software designed for the PC, XT, and AT on 386 computers?

At present, there are no problems running existing software in the real and virtual-86 modes of a 386-based machine. In the real mode, you can run one program at a time. In the virtual-86 mode you can run programs

THE CORPORATE PERSPECTIVE

Assessing the potential uses for a new generation of personal computers is no small feat for any company. When the company has more than 30,000 employees and 7,000 personal computers, the list is endless.

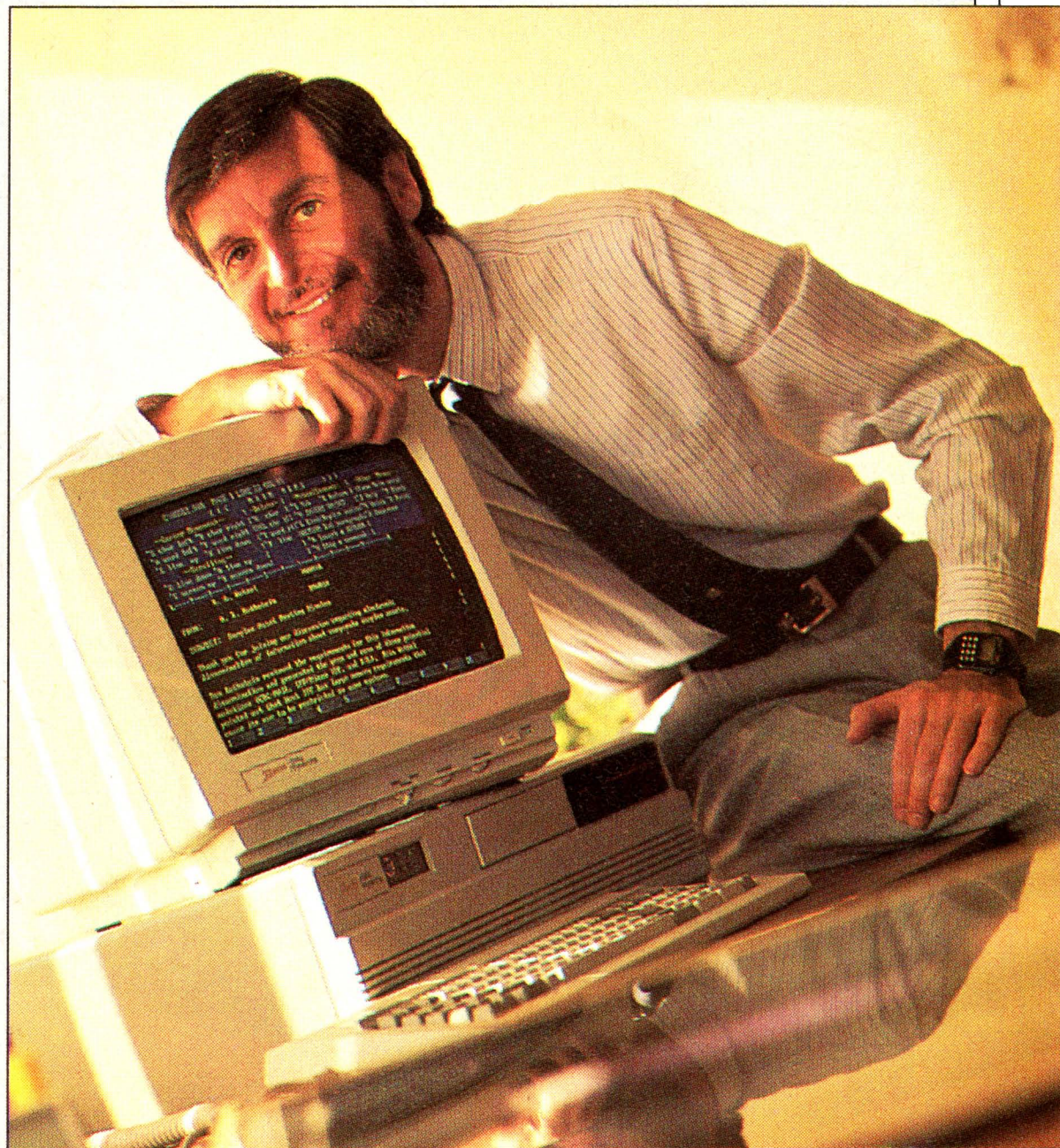
"We have a little different perspective than a single user does," says Ron Rothstein, who is in charge of all those considerations for Control Data Corp. (CDC) in Minneapolis, Minn. Shortly after the first of the year, Rothstein expanded the perspective of his office to include the 80386 generation, particularly a prototype version of the Zenith Data Systems Z-386. As manager of Micro Workstation Technical Support Services, Rothstein set out to determine what a 386 could bring to the party. In addition to using computers for applications common to any large corporation, CDC is a reseller, packaging hardware along with business, engineering, and educational software for its customers.

Along with other large customers, CDC was asked by Zenith to serve as a test, or beta, site for the new machine, keeping track of the bugs that are inevitably found in any preproduction piece of hardware. Rothstein is quick to point out that agreeing to conduct tests on a new machine isn't an endorsement, especially since CDC buys computers from a number of companies besides Zenith. That said, he also says that he likes the Z-386.

The analysts involved in testing the 386 had a long list of things to look for, including but not limited to raw performance, both as a stand-alone machine and on a network; compatibility with MS-DOS and the IBM architecture, both hardware and software; the number of expansion slots and ports; the power supply; FCC certification and Underwriters Labs approval; reliability; availability; training and support from Zenith, including being able to get enough information to educate CDC employees about the technical aspects of the machine; price; the amount of space required on a desk top; fan and disk noise. On another level were business considerations such as Zenith's long-term prospects as a personal computer manufacturer, the breadth of its overall product line, and its upgrade and pricing policies.

All indications are that the Z-386 passed. "Overall, we're pretty positive about using 386-based systems with Control Data applications," says Rothstein. "In those areas where the added performance justifies the added costs, we'll go ahead and use them." Those areas include users on networks, those with engineering applications, and those who spend a lot of time waiting for Lotus 1-2-3 to recalculate or dBase to sort. If reaction to the beta machine is any indication, he also expects that some CDC users will want to upgrade from an IBM PC or PC AT-class to a 386.

CDC's tests showed that the 16MHz Z-386 equipped with 1Mb of RAM will save more than five or 10 seconds here and there. Matched against 8088-based machines, it was about six to 11 times as fast at tests that included multiplication and division, sorting, and memory access. It was about two to two and a half times faster than Zenith's Z-248, an AT-compatible running at 8MHz with no wait states. The beta unit didn't come with a numeric coprocessor, which would make the differences more noticeable for scientific calculations. It was about 25 percent faster than the 80286-based Z-248 on input/output tests



RON ROTHSTEIN: "It's not worth waiting....We're excited about new technology and applying it wherever it makes sense."

such as accessing the 40Mb hard disk, which CDC coincidentally supplies to Zenith.

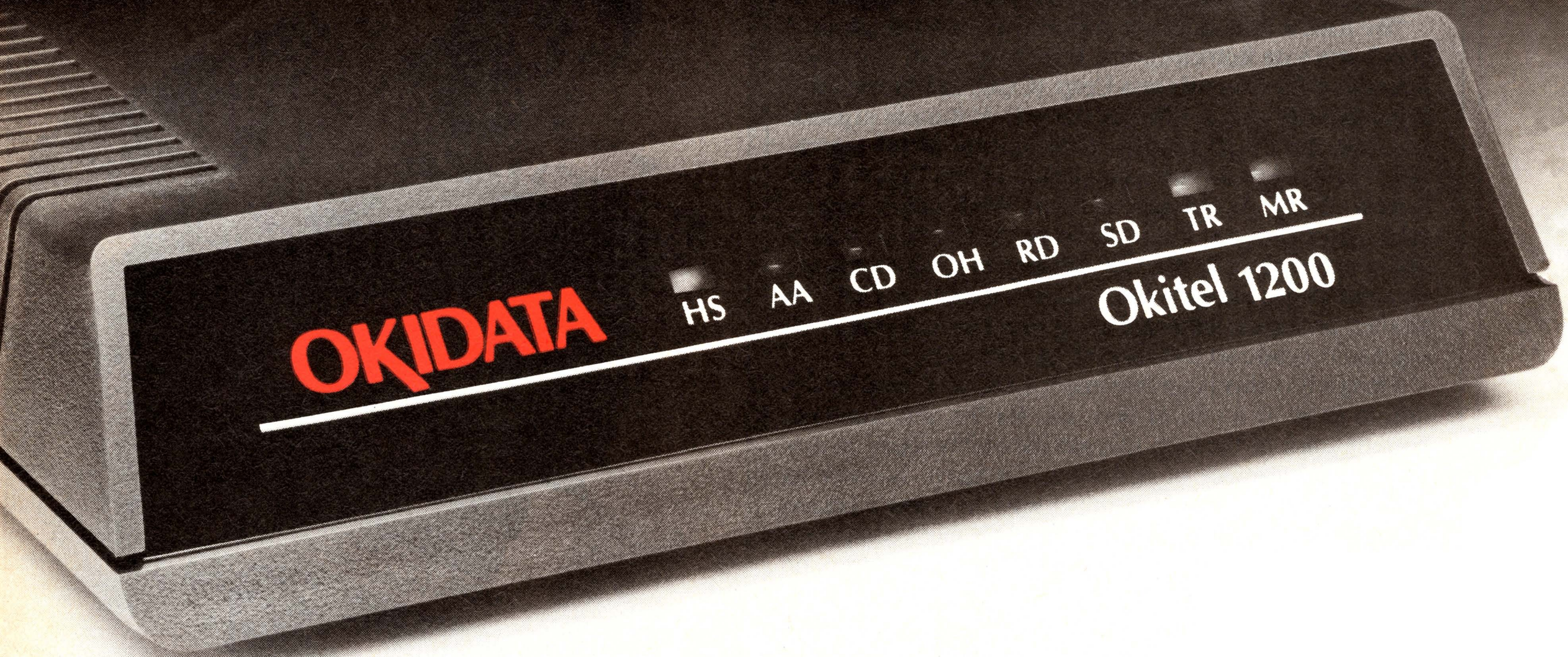
The machine wasn't flawless. Problems were evident on some copy-protected software. The high-density floppy disk drives are so fast that they can cause such software to fail copy-protection tests. Similar problems were reported by beta users of Compaq Deskpro 386 computers. Like Compaq, Zenith will correct the flaw. Most software, including WordStar and MultiMate as well as proprietary CDC programs, such as IM/personal and Control Data Connect, ran without a hitch, according to Rothstein. The Technical Support Services testing also uncovered potential maintenance and training problems because switch settings are different from those on current machines.

On the basis of the early testing, Rothstein says he won't hesitate to recommend 386 machines for some CDC users. His reasoning is based, in part, on an assumption that Microsoft's DOS for 286 machines, which is expected later this year, will maintain some compatibility with existing applications rather than break new ground. "If it doesn't support existing applications, we will have to make some tough decisions," he says. And while he's aware that IBM might choose to take a proprietary hardware route, Rothstein isn't overly concerned. "It's not worth waiting until it's all sorted out," he says. "We're excited about new technology and applying it wherever it makes sense."

—S.R.R.

JAMES SCHNEPP

Funny. It doesn't look like a printer.



It's Not.

It's the New OKIDATA PC Modem.

If the name's familiar but you can't place the face, relax. The new OKITEL™ 1200 is every bit as good at "bits per second" as our printers are at "characters per second."

And that's very good.

You see, besides being a big name in personal printers, OKIDATA is a titan in telecommunications. Our parent company is one of the biggest telecommunication equipment suppliers in Japan.

Get It Right the First Time

With Automatic Adaptive Equalization.

Because the OKITEL 1200 automatically adapts to widely varying line quality, your data rarely gets lost or disconnected by a "noisy" line. So you hardly ever have to re-transmit. A convenience usually found only in higher-speed modems.

Our new PC modem also offers auto-dialing, auto-answering, and auto-disconnecting. The ability to use tone or pulse-dialing. As well as a special self-diagnostic loopback.

On-Line, On-the-Double.

To help you get instantly acquainted with your OKITEL 1200, we're including a special introductory offer that provides up to \$150 in discounts on three of the most popular on-line services: CompuServe®, Newsnet® and Dow Jones® News/Retrieval.

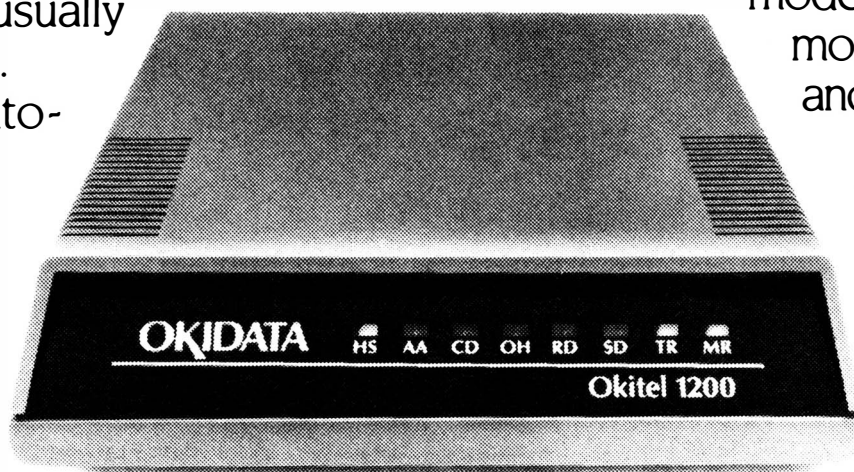
Turn Ordinary Minutes Into OKIDATA Minutes.

When you use a modem, every minute means money. But an OKIDATA Minute actually saves you money. You get a full 60 seconds of quality time every minute you're on-line because you get it right the first time.

The OKITEL 1200 PC Modem. Fewer transmission breaks, plus automatic error detection and automatic adaptive equalization.

Start getting your money's worth out of every modem minute. Get the new OKITEL 1200 modem with the very familiar—and very respected—name.

Call toll-free, 1-800-OKIDATA for the name of the OKIDATA dealer nearest you.



OKIDATA®
an OKI AMERICA company

simultaneously (subject to the limitations of the 8088/86 chip), provided you have Desqview or another operating environment that will permit multitasking. In this mode, you can run any number of what are referred to as multiple virtual DOS sessions—the result is like having several personal computers on your desk.

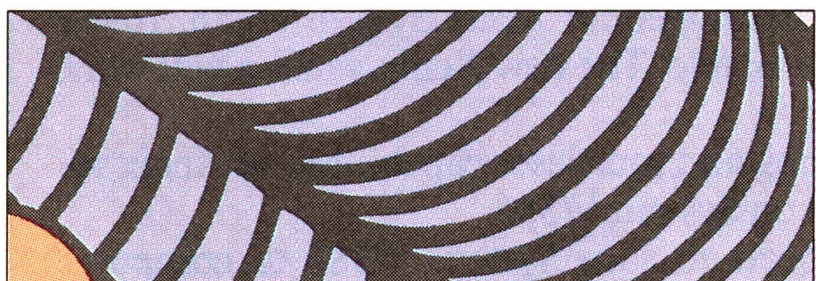
Existing DOS programs will not run in the protected mode. There'll have to be new programs written specifically for the protected mode before you can take advantage.



Since 286 hardware in the form of the IBM PC AT and compatibles has been available since early 1985, why is it taking Microsoft so long to develop the operating system?

Microsoft says it takes a lot of time to develop software, especially a complicated operating system. Others point to IBM as the reason a new DOS hasn't been introduced, suggesting that it either wants to delay the 386 generation or add proprietary extensions to DOS. Such additions take extra time. In fact, it has even been suggested in an insider newsletter (*California Technology Stock Letter*) that IBM is putting proprietary layers on the 386 chip itself, something it has a legal right to do. These are complex changes that probably could not be completed before the fall of 1987, and could even delay future releases of MS-DOS.

But the primary slowdown is the extremely complex nature of the job. The 386 chip required more than two years' development time by the team at Intel. Designing and debugging a software operating system for it that will maintain compatibility with earlier DOS versions while exploiting advanced modes is a daunting one. It takes time.



Why doesn't Microsoft just introduce a new DOS on its own without waiting for IBM? And what is the difference between PC-DOS and MS-DOS?

Microsoft contends that DOS isn't just another software program, because it must be written to work on specific hardware. So far, every version of DOS has been tailored initially to IBM hardware. In the past, IBM has announced its PC-DOS simultaneously

ECONOMIC POWER

Economist Harry Bowen has no trouble explaining why he bought a 386-generation personal computer. It's proficient at regressions, which figure prominently in the statistical analyses he performs at the National Bureau of Economic Research, a nonprofit organization in Cambridge, Massachusetts.

Before buying a Compaq Deskpro 386, Bowen performed real-world benchmark tests using a data base that has to cope with nine variables, 50 observations, and 27 iterative regressions at a time. The task took 25 minutes on a 6MHz PC AT and 15 minutes on the 386, which has an 80287 math coprocessor.

Since buying the 386, Bowen has become even more aware of how slow the basic PC clone he has at home is. He recently spent "essentially all day" working on a project at home. The same project took only two hours on the 386 he has at his office.

Bowen, who is a professor of economics and international business in the Graduate School of Business at New York University, is on an Olin Fellowship at the bureau, an organization that disseminates economic information and research. He uses the 386 primarily for word processing and to run the personal computer version of Statistical Analysis System, a mainframe program. When his fellowship ends this summer, the 386 will accompany Bowen to NYU, along with his other two computers, a PC clone and a portable. Bowen anticipates using the 386 for the foreseeable future, and is excited about exploring the multitasking capabilities likely to be part of a new operating system.

Despite some concern about the ramifications of a new DOS and the ultimate capabilities of the Intel 80386 chip, Bowen says he decided to go ahead and buy one now because, at worst, he'll end up with a fast AT. He opted for a 40Mb hard disk and 2Mb of RAM. He chose an AST Enhanced Graphics Adapter and NEC's Multisynch monitor in lieu of the EGA card and monitor that Compaq sells as options.

Bowen's concerns about an operating system that will take advantage of his new machine are relatively minor. Through trade publications, he has kept up with the rumors about an advanced DOS but says he didn't have time to get into it deeply before buying the Compaq. "If someone comes out with an operating system, I'll be happy with it," he says. Articles about the possibility that the virtual mode of the Intel 80386 chip itself isn't as advanced as he thought caused some disappointment.

Bowen plans to use the 386 as a stand-alone machine so he doesn't have to worry about many of the potential problems corporations face as they integrate a new generation with hundreds or thousands of 8088- and 80286-based computers and scores of existing applications. "To me, a personal computer is personal."

After using the machine for several weeks, Bowen says he has a few minor complaints about the keyboard layout and the speed of the tape backup. He's also doesn't see much reason for a 1.2Mb floppy disk drive as long as there's a tape backup. Overall, though, he describes himself as "real happy" with it.

Shortly after buying the 386 Bowen thought that he had a major problem when the disk drive got stuck and wouldn't boot from the hard disk. His concerns increased when he remembered that he hadn't backed up his work. He returned the machine to the dealer, who initially said a new drive would have to be ordered, with delivery in two months because of an order backlog. Before agreeing to wait for a new drive, Bowen suggested trying the drive after it had been removed from the case. Miraculously, the drive worked, was reinstalled, and hasn't been a problem since.

—S.R.R.

386 OPERATING SYSTEMS

According to its specifications, Intel's 80386 processor can run programs in DOS and Unix concurrently, and use four gigabytes (4Gb) of memory. But the 386 processor can do none of those things with current versions of MS-DOS.

A new version of MS-DOS that is expected to be released by Microsoft this year will not fully tap the power of the 386. The "new" DOS is expected to address the 16Mb memory capacity of the 286 chip's protected mode, but not the 4Gb limit of the 386 chip's protected mode. Further, existing applications will have to be rewritten to take advantage of the added memory the new DOS addresses.

At present, the only way to enjoy 386 perks, besides speed, is to use a different operating environment in addition to, or in lieu of, MS-DOS. The following is a rundown of alternative operating environments either available now or that will be introduced in the near future.

DESQVIEW 2.0 from Quarterdeck Office Systems is a multitasking MS-DOS environment that operates in the virtual-86 mode of the 80386 processor. It is an enhanced version of the original Desqview that enables users of 286-based computers to run applications simultaneously. Users can run nine MS-DOS applications simultaneously. The maximum amount of addressable RAM is 640k unless extended memory is present. It retails for \$130.

Version 2.0 is an upgrade of version 1.3, the first Desqview version designed for 386-based computers. Changes in version 2.0 include the ability to run programs designed for TopView, GEM, and Windows; and improved display of colors on an EGA monitor. *Quarterdeck Office Systems, 150 Pico Blvd., Santa Monica, CA 90405; (213) 392-9851. (For more information, circle 370 on one of the Free Information Cards.)*

PC-MOS/386 from The Software Link is an MS-DOS-compatible operating system that does not require the presence of MS-DOS to run.

PC-MOS/386 permits multitasking of current applications in the virtual-86 mode. The Software Link expects to run software written for the 286 and 386 protected modes once that software becomes available. In the virtual-86 mode, PC-MOS/386 runs an unlimited number of MS-DOS applications simultaneously. Each application is restricted to 640k of RAM unless extended memory is present, and the application supports the Lotus/Intel/Microsoft extended memory specification.

The Software Link plans to introduce a single-user version of PC-MOS/386 (\$195) and two multiuser versions early this month. One multiuser version supports five users (\$595) and the other supports 25 users (\$995). *The Software Link, 8601 Dunwoody Place, Suite 632, Atlanta, GA 30338; (404) 998-0700. (For more information, circle 371 on one of the Free Information Cards.)*

VM/386 from Softguard Systems is a single-user environment that runs applications in the virtual-86 mode and requires MS-DOS. VM/386 can run any combination of DOS and Unix software and any other software designed to run on an 8088- or 80286-based computer.

VM/386 does not provide windowing of programs but does work with programs offering this feature, such as

Microsoft Windows, and Quarterdeck's Desqview. You can cut and paste data between applications with VM/386.

Softguard plans to sell VM/386 to corporate accounts and distribute it through retail stores by June. The company will also distribute it to computer manufacturers to be bundled with their computers. Softguard is considering selling VM/386 for slightly under \$300 but no price has been set. *Softguard Systems, 2840 San Tamos Expwy., Suite 201, Santa Clara, CA 95051; (408) 970-9240. (For more information, circle 372 on one of the Free Information Cards.)*

VP/ix enables any number of DOS and Unix applications to run simultaneously. Developed jointly by Phoenix Technologies and Interactive Systems Corp., the program enables users to use DOS commands and load DOS applications from the Unix prompt and vice versa. The primary markets for VP/ix, according to Lance Hansche, vice-chairman of Phoenix Technologies, are owners of 386-based computers who "experiment with both DOS and Unix," people in a multiuser environment with a mixture of Unix and DOS packages, and Unix users who want to be able to use the wide range of DOS applications.

Two versions of VP/ix will be sold: a single- or two-user version (\$495) and a version for three or more users (\$795). Phoenix and Interactive Systems will sell VP/ix to computer manufacturers who will offer it with their 386-based computers. *Phoenix Technologies Ltd., 320 Norwood Park South, Norwood, MA 02062; (617) 769-7020; and Interactive Systems Corp., 2401 Colorado Ave., Santa Monica, CA 90404; (213) 453-8649. (For more information, circle 373 on one of the Free Information Cards.)*

MERGE 386 from Locus Computer Systems also enables users to run DOS applications from Unix and vice versa, and run DOS and Unix applications simultaneously.

Locus is distributing Merge 386 through computer manufacturers and expects that the manufacturers will offer it to the public sometime during this coming summer. *Locus Computing Corp., 3350 Ocean Park Blvd., Santa Monica, CA 90405; (213) 452-2435. (For more information, circle 374 on one of the Free Information Cards.)*

XENIX SYSTEM V/386 from Microsoft Corp. enables programs to use the 32-bit architecture of the 386 chip and address 4Gb of memory. System V/386 also runs Xenix software written for the 8088 and 80286 chips. When it runs Xenix programs developed for Xenix System V/286, 16Mb of memory are available. The new Xenix version will work with VP/ix.

The multitasking and multiuser capabilities of Xenix remain unchanged on System V/386.

Microsoft expects to ship System V/386 to computer manufacturers by the end of March; and to Santa Cruz Operations, which will distribute System V/386 to value-added resellers. Maritz expects the "typical price" for the new version to be in the \$500 to \$600 range. *Microsoft Corp., 16011 NE 36th Way, Box 97017, Redmond, WA 98073-9717; (206) 882-8080. (For more information, circle 375 on one of the Free Information Cards.)*

(For more information on all the products listed above, circle 376 on one of the Free Information Cards.)

—P.H.

with Microsoft's announcement of MS-DOS. PC-DOS is MS-DOS written to run on IBM hardware. MS-DOS is the name of the operating system that Microsoft licenses to non-IBM manufacturers. Working with Microsoft, the "other" manufacturers tailor MS-DOS to their hardware and release it as their own DOS. That's why various versions are called, for instance, Compaq DOS, Tandy DOS, or Zenith DOS.



In the meantime, could business people get some of the same benefits with operating systems that already have multitasking, like Unix and Xenix?

Yes. One problem at present is that most MS-DOS users would not realize enough benefits to make it worthwhile to learn an entirely new operating system. Secondly, Unix and Xenix do not have the thousands of software programs written for them that MS-DOS does. "Unix right now is for so called 'power users.' The command set is cryptic and unknown. DOS is cryptic also, but at least people know it," says Intel's Dana Krelle.

Phoenix Technologies, Norwood, Mass., is developing VP/ix, an operating environment for 386-based computers that will enable existing MS-DOS applications to run without modification under Xenix System V/386 from Microsoft (see related story). The new Xenix version from Microsoft is expected to be released shortly.



Can the 386 run Unix and DOS concurrently? Would running both help in network settings?

The 386 is able to run any combination of operating systems and programs under those operating systems concurrently. The only requirement is that you have enough memory to handle all the tasks.

Would it help in network settings? Yes, if there were a reason to run those or any other combination of operating systems concurrently. One likely possibility would be Unix running side by side with a business-oriented operating system such as Pick. A 386 computer as a file server on a network could handle both operating systems with ease—while providing MS-DOS capability as well. In fact, it

may really be in the networking arena that the power of the 386 will be felt most quickly.



At this point, can IBM fundamentally alter the 386 standard if it introduces a 386 computer that uses some proprietary components in its operating system?

Those companies that have announced 386 machines believe that the installed base of MS-DOS machines and software is too big a market for anyone, including IBM, to ignore. Compaq, which announced and shipped the first 386, contends that users, for the most part, won't follow IBM if it decides to market a 386 incompatible with DOS. A much likelier scenario has IBM introducing a 386 compatible with the existing hardware-software base but with built-in proprietary components. These could be in the form of IBM-designed chips containing portions of the operating system in ROM (read-only memory) or as additions to the 80386 itself. Such a move on IBM's part is quite possible. The results would cause some casualties among clone makers, followed by eventual copying of the proprietary components by others.



How do upgraded XTs and ATs compare to the capabilities of 386 machines?

Very well, it would appear. XT- and AT-compatible computers can be upgraded through a board to perform with some or all of the added features of a 386-based computer. The two types of upgrade boards are turbo boards and hypervisor boards. Turbo boards have an 80386 chip and supporting processors, on-board memory, and a crystal. The last allows the 80386 to run faster than the host computer. Hypervisor boards have everything but the crystal. They adhere to the clock speed of the host, giving them a 386's memory-management and multitasking capabilities but not much speed advantage. In fact, depending on the operation, processing may even be slower than with an AT.

You pay for the added speed of the turbo boards. They cost about \$1,500 and more, depending on how much RAM comes on the board. The hypervisor boards are priced at

**MANUFACTURERS
OF 80386-BASED
COMPUTERS
BELIEVE THE
INSTALLED
BASE OF MS-DOS
MACHINES IS
TOO BIG FOR IBM
TO IGNORE.**

UPGRADE PLANS

The most significant question for many computer users now is, "What difference will 386 computers running under the advanced version of MS-DOS make?" The advanced features available to the 386 generation of computers give rise to speculation about what new applications will be available—what new things users will be able to do with personal computers. To find out, we asked some of the major software companies how they plan to revise their products to exploit the benefits of DOS 5.0.

Unfortunately for those who like to look ahead, many of these firms are reluctant to acknowledge that they are even working with a preliminary version of the new DOS—due to strict nondisclosure agreements. In fact, one major company has been working with advanced DOS for almost two years. Aside from the nondisclosure problem, some companies would not divulge information regarding future changes to their programs or new programs they might be developing, because they did not want to tip their hand to competitors. Others said that until ADOS is released, it is impossible to predict exactly what changes will evolve. Micropro, Borland, Ansa, Computer Associates, and Symantec, for example, all stated only that they would support DOS 5.0.

In general, though, most of the companies said they will revise their programs to handle multitasking, but are waiting for the arrival of DOS 5.0 before making any definite decisions. The following companies were willing to offer some specifics:

ASHTON-TATE's major product lines will support DOS 5.0 and, consequently, benefit from the areas of multitasking and memory management. Regarding memory management, dBase users will find the programs's performance enhanced by having less need for disk access. All of the dBase code plus its data bases could be contained in RAM. To address the advantages of multitasking, which will allow, for example, a user to start printing a MultiMate document while executing a query in dBase, Ashton-Tate's single-application products will be designed to work together in a windowing environment for DOS 5.0.

MICROSOFT CORP. spokespeople said the firm plans to take advantage of DOS 5.0 by integrating its spreadsheet and word processing applications. DOS 5.0 will be able to address more than 640k of memory. Multiplan and Microsoft Word, for example, could be in memory at the same time. Microsoft will modify its packages so that they will be able to handle multitasking. It will likely increase the size of the spreadsheet for Multiplan, and alter Word and Multiplan so that they can handle background printing (for example, when you're in one program you can print a document from another). Another way the two programs might be integrated is by adding the capability for pasting spreadsheet information into the word processor.

SOFTWARE PUBLISHING's Harvard series will take advantage of DOS 5.0. The three programs in that series, The Total Project Manager II, the Professional Publisher, and Presentation Graphics, all could benefit from the new DOS, according to representatives of the firm. For example, the Professional Publisher, a desktop publishing package, could have its variety of font types all available in memory.

WORDPERFECT CORP. is moving toward adding multitasking capabilities to WordPerfect, MathPlan, and WordPerfect Library, according to company president, Alan Ashton. The company plans to step up the printing capabilities of the programs so that a user can be in WordPerfect Library, for example, and be printing a document in WordPerfect. Other areas of WordPerfect that are subject to change are its spelling checker and thesaurus. With the new DOS and its ability to address large amounts of memory, the spelling checker and thesaurus might be larger, faster, and kept on-line at all times.

—Stephanie Makrias and Heather-Jo Taferner

about \$500. Manufacturers of turbo boards include Intel, American Computer and Peripheral in Santa Ana, Calif.; Applied Reasoning of Cambridge, Mass.; Gold Hill Computer of Cambridge, Mass.; Quadram Corp. of Atlanta, Ga.; and Orchid Technology of Fremont, Calif. Manufacturers of hypervisor boards include Cheetah International of Longview, Texas, and American Computer and Peripheral, Inc., of Santa Ana, Calif.

Both boards are viable alternatives for someone who wants the benefits of an 80386 computer but doesn't want to scrap a healthy AT or compatible. Which one is right for you? It comes down to a decision about whether you want the speed or not. Gene Sumrall, vice-president of Cheetah International, says people "perceive they need a faster AT" when in fact they may not. He points out that while the Adapter 386 from Cheetah and other hypervisor boards may not provide faster speed, the ability to perform multitasking may save you all the time you need.

While a turbo board speeds the processing speed of an XT or AT, other computer operations, such as hard disk access, work at the same speed they would if the computer were still functioning as an XT or AT. A turbo board would work fine for someone who does a lot of spreadsheet recalculations, for example, because this typically happens in memory and does not require disk access. In contrast, word processing and data bases access the disk frequently and may perform slower than they would on a complete 386-based computer.



Since there are other 32-bit microprocessors, from companies like NEC and Motorola, why is there so much more interest in this Intel chip?

Because corporate America has adopted the IBM PC architecture as a hardware standard and MS-DOS as a software standard. The huge installed base, both hardware and software, guarantees an instant market for 80386-based products. Those users are likely to upgrade to 80386-based personal computers, partly because they can use existing peripherals and continue to run standard software.

The Motorola 68020 has many of the features of the Intel 80386, including the ability to address 4 gigabytes of RAM, but it has not been used in a personal computer that runs MS-DOS software. Apple's Macintosh, Commodore's Amiga, and Atari's ST use Motorola 68000s, which are 16/32-bit chips. So far, at least, software developers and mak-

ers of peripheral hardware have seen more potential business in writing for the Intel family of chips because that's what businesses use.



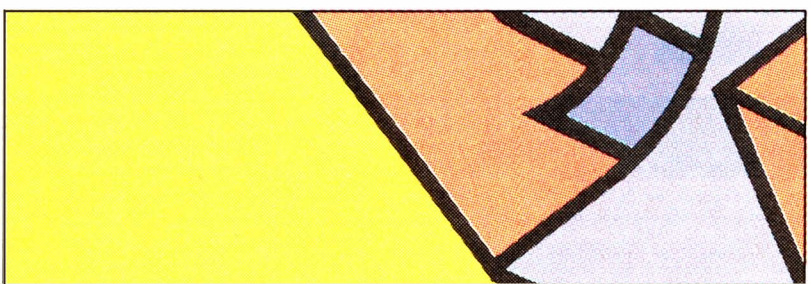
If Intel is on target and ships between 500,000 and a million 386 chips in 1987, what sort of pricing will we see in 1988 on such computers?

It's unlikely that mainstream prices will drop much below \$4,000 for a hard disk-equipped computer. Manufacturers are currently paying about \$300 for each 386 chip they buy from Intel, which says it sold 90,000 386 chips in 1986, compared to 1.4 million 286 chips.



How many 386-based personal computers will be on the market by the middle of 1987?

Intel says it is working with more than 150 companies designing products that use the chip. Chips and Technologies, Milpitas, Calif., which sells a 386 companion chip set to companies that don't want to design their own motherboards, estimates that from 30 to 50 manufacturers will be selling 386 computers that use their chip set by the middle of 1987. And while personal computers are the largest 386 marketplace, they're by no means the only products to use the chip.



What are the thousands of users who have already purchased Intel 80386-based personal computers using them for right now?

The primary motivation cited by the users we have interviewed is to speed existing applications. Even a turbo-charged AT can seem to take forever to sort a large data file or recalculate a big Lotus 1-2-3 spreadsheet. With a math coprocessor, the first 386s on the market work at least twice as fast as the AT generation while maintaining software and hardware compatibility. Some users say 80386 file servers make their networks run

faster; others are buying them in lieu of scientific workstations for computer-aided design.



Is the 386 chip used in anything other than personal computers?

Among the places you'll find them are in minicomputers, sophisticated printers, robotics controllers, military guidance systems, and PBX telephone systems. They're also in machines used for developing artificial intelligence programs. Those applications can already use the chip's 32-bit architecture, which generated market pressure on Intel to release the chip even if the personal computer marketplace wasn't necessarily ready to cope with a new generation. Intel says it knows of more than 150 companies working on projects using 386 chips.



What's next for the 80xxx series? When will we see the 80486 chip? Is this beyond the personal computer arena, or will there be an endless succession of more powerful chips?

Development time for a new chip is about two and a half years. The 386 was formally announced in the fourth quarter of 1985 and became widely available about a year later. If that cycle stays the same, look for an 80486 to be introduced in the first half of 1988. Intel will say only that its 80486 chip will be 100 percent compatible with the 386 and will have performance that is several times higher. There's no end in sight.



When should I buy a 386-based computer?

When the price and performance of the computer meet your budget and needs. Don't wait for the new version of DOS if you need the speed now, but hold off if you have to have multitasking or access to massive memory. Until 286DOS is released, no one can say for certain that the 386-based computers won't have a few glitches. ■

LOOK FOR AN
80486 CHIP IN
1988. INTEL
SAYS THE CHIP
WILL REMAIN
COMPATIBLE WITH
THE 386 BUT
HAVE ADDITIONAL
FEATURES.

THE COMPUTER THAT CONQUERED TIME

Finally—a computer that breaks through the barriers of time and space to help you become more *productive*.

The PC's Limited 286¹² runs at a record-setting 12 megahertz, yet it occupies 20% less space than the older, slower "big-name" brand.

Now—can you afford not to be a "power user"?

ALSO CONQUERS SPACE.

The 12-megahertz 286¹² and 8-megahertz 286⁸ come complete with a 1.2 megabyte floppy disk drive, 1,024K of high-speed RAM, 200-watt power supply and an AT-style keyboard.

Both feature SmartVu™, an alphanumeric LED panel that's a window on your world of computing, a look into the heart of the computer, reporting operating speeds and diagnostic messages in understandable English.

The 286⁸ and 286¹² have been created by the best team of computer-hardware designers in the business. A totally new motherboard, custom ROM BIOS and proprietary circuits have been developed for this high-performance computer environment. And *every* 286⁸ and 286¹² is bench-tested and run through an extensive burn-in before shipment.

PC's Limited was the first direct-response marketer to offer high-quality, low-priced PC-AT compatibles. PC's Limited has been a leader in pushing high-performance personal computing through price barriers. The experience gained from selling and supporting thousands of high-performance PCs to customers ranging from Fortune 500 companies to solo users has been applied to designing the most advanced personal computers ever produced: the PC's Limited 286⁸ and 286¹².

Naturally, the 286⁸ and the 286¹² are backed by PC's Limited's One-Year Limited Warranty, and by our 30-day Money Back Guarantee.

Twelve megahertz or eight megahertz... the choice is yours. *In high-performance computing, the choice is clear: PC's Limited.*



PC'S LIMITED

SALES CALLS OUTSIDE TEXAS, 1-800-426-5150

SALES CALLS INSIDE TEXAS, 1-800-252-8336

1611 Headway Circle, Building 3, Austin, Texas 78754

Sales Calls from anywhere in the country, (512) 339-6962

Technical Support Calls, 1-(800) 624-9896 or PC's Limited BBS (512) 339-4127

Customer Service Calls, 1-(800) 624-9897 or MCI MAIL: PC's Limited

Telex No. 9103808386 PC LTD FAX (512) 339-6721

1-800-426-5150

IBM Personal Computer AT is a trademark of International Business Machines Corporation. SmartVu, 286¹² and 286⁸ are trademarks of PC's Limited.

COMPATIBLE DESIGN. INCOMPARABLE PERFORMANCE. INCREDIBLE VALUES.

CHOOSE FROM THESE COMPLETE SYSTEMS.

PC'S LIMITED TURBO PC™

Monochrome Systems

- Intel 16-Bit 8088-2 System Unit running at 4.77 MHz and 8.0 MHz
- 640K on Motherboard
- AT™-Style Keyboard
- 130 Watt Power Supply
- Hercules Compatible Graphics Adapter with one Parallel Port
- PC's Limited Mono-IIA Flat Screen Monochrome Monitor with Tilt and Swivel Base

with two 360K Floppy Disk Drives— **\$859**

with one 360K Floppy Disk Drive and one 20 Meg, 65 MS Hard Disk Drive— **\$1199**

EGAds! Color Systems

- Intel 16-Bit 8088-2 System Unit running at 4.77 MHz and 8.0 MHz
- 640K on Motherboard
- AT™-Style Keyboard
- 130 Watt Power Supply
- PC's Limited EGAds! Card
- PC's Limited EGAds! Monitor

with two 360K Floppy Disk Drives— **\$1229**

with one 360K Floppy Disk Drive and one 20 Meg, 65 MS Hard Disk Drive— **\$1589**

PC's Limited 286⁸

Monochrome Systems

- Intel 80286 running at 8 MHz
- 1024K on Motherboard
- 1.2 Meg Floppy Disk Drive
- Combined Floppy and Hard Disk Controller
- AT™-Style Keyboard
- 192 Watt Power Supply
- Clock/Calendar with Battery Backup
- Hercules Compatible Monochrome Graphics Card
- 2 Serials and 2 Parallel Ports
- PC's Limited Mono-IIA Flat Screen Monochrome Monitor with Tilt and Swivel Base

with 20 Meg, 65 MS Hard Disk Drive, Space Saving Chassis— **\$1795**

with 30 Meg, 40 MS Hard Disk Drive, AT™ Standard Chassis— **\$2195**

EGAds! Color Systems

- Intel 80286 running at 8 MHz
- 1024K on Motherboard
- 1.2 Meg Floppy Disk Drive
- Combined Floppy and Hard Disk Controller
- AT™-Style Keyboard
- 192 Watt Power Supply
- Clock/Calendar with Battery Backup
- PC's Limited EGAds! Card
- 2 Serials and 1 Parallel Ports
- PC's Limited EGAds! Monitor

with 20 Meg, 65 MS Hard Disk Drive, Space Saving Chassis— **\$2195**

with 30 Meg, 40 MS Hard Disk Drive, AT™ Standard Chassis— **\$2595**

PC's Limited 286¹²

Monochrome Systems

- Intel 80286 running at 12 MHz
- 1024K on Motherboard
- 1.2 Megabyte Floppy Disk Drive
- Combined Floppy and Hard Disk Controller
- AT™-Style Keyboard
- 192 Watt Power Supply
- Clock/Calendar with Battery Backup
- Hercules Compatible Monochrome Graphics Card
- 2 Serials and 2 Parallel Ports
- PC's Limited Mono-IIA Flat Screen Monochrome Monitor with Tilt and Swivel Base
- AT™-Standard Chassis

with 30 Meg, 28 MS Hard Disk Drive— **\$3095**

with 40 Meg, 28 MS Hard Disk Drive— **\$3295**

EGAds! Color Systems

- Intel 80286 running at 12 MHz
- 1024K on Motherboard
- 1.2 Megabyte Floppy Disk Drive
- Combined Floppy and Hard Disk Controller
- AT™-Style Keyboard
- 192 Watt Power Supply
- Clock/Calendar with Battery Backup
- PC's Limited EGAds! Card
- 2 Serials and 1 Parallel Ports
- PC's Limited EGAds! Monitor
- AT™-Standard Chassis

with 30 Meg, 28 MS Hard Disk Drive— **\$3495**

with 40 Meg, 28 MS Hard Disk Drive— **\$3695**



(Tape backup optional)

A GUARANTEE THAT STANDS UP.

PC's Limited has established itself as the leader in PC technology. And the guarantee and warranty programs we offer put us ahead of the pack, too. Here are our terms in plain English.

30-Day Total Satisfaction Guarantee—Any item bought from PC's Limited may be returned within 30 days from the date it was shipped for a full refund of your purchase price. Returned items must be as-new, not modified or damaged, with all warranty cards, manuals, and packaging intact. Returned items must be shipped prepaid and insured, and must bear a PC's Limited Credit Return Authorization (CRA) on the shipping label.

One Year Limited Warranty—PC's Limited warrants the products it manufactures to be free from defects in materials and workmanship for one year following the date of shipment from PC's Limited. During the one year warranty period, PC's Limited will repair or replace, at its option, any defective products or parts at no additional charge, provided that the product is returned, shipping prepaid, to PC's Limited.



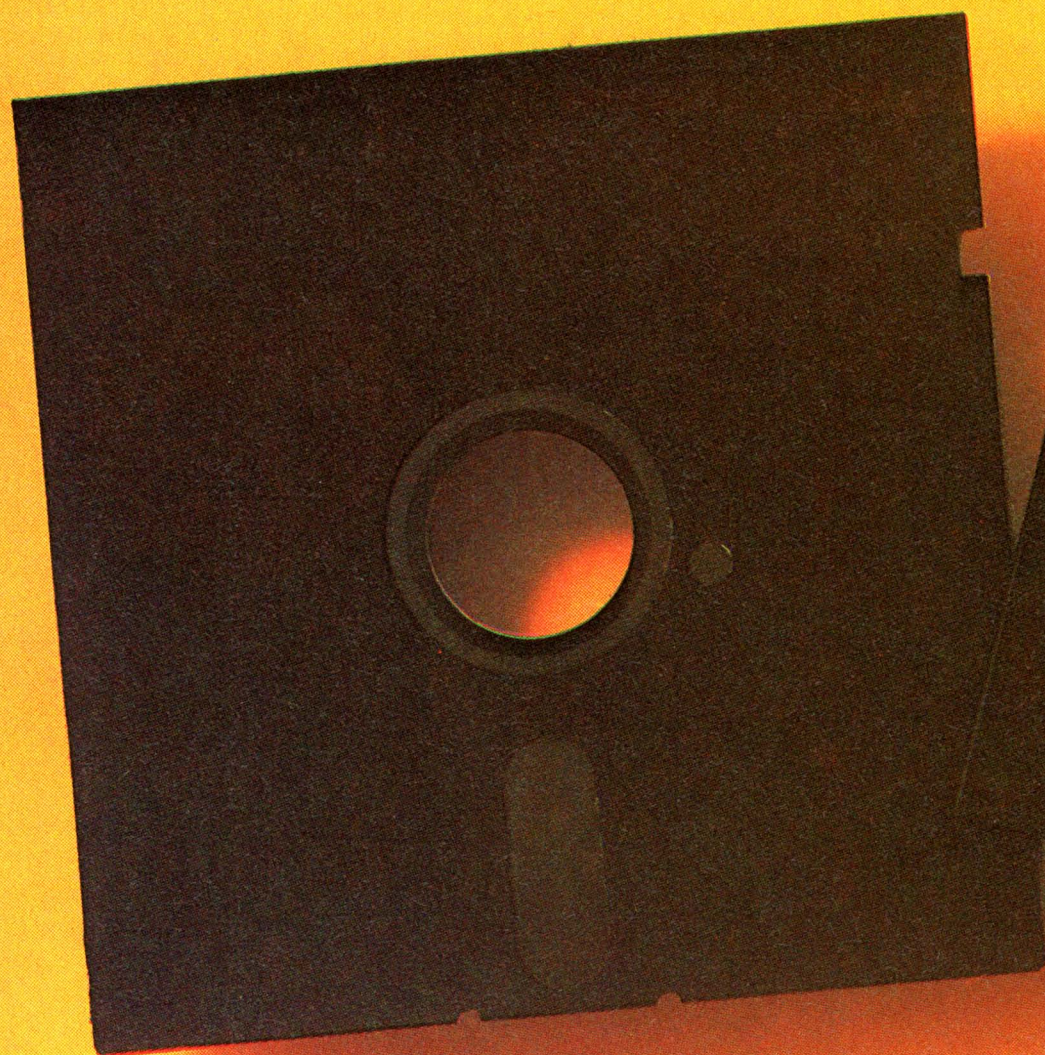
To buy PC's Limited computers, call us directly at 1-800-426-5150.
Calls inside Texas, 1-800-252-8336.

1611 Headway Circle, Building 3, Austin, Texas 78754

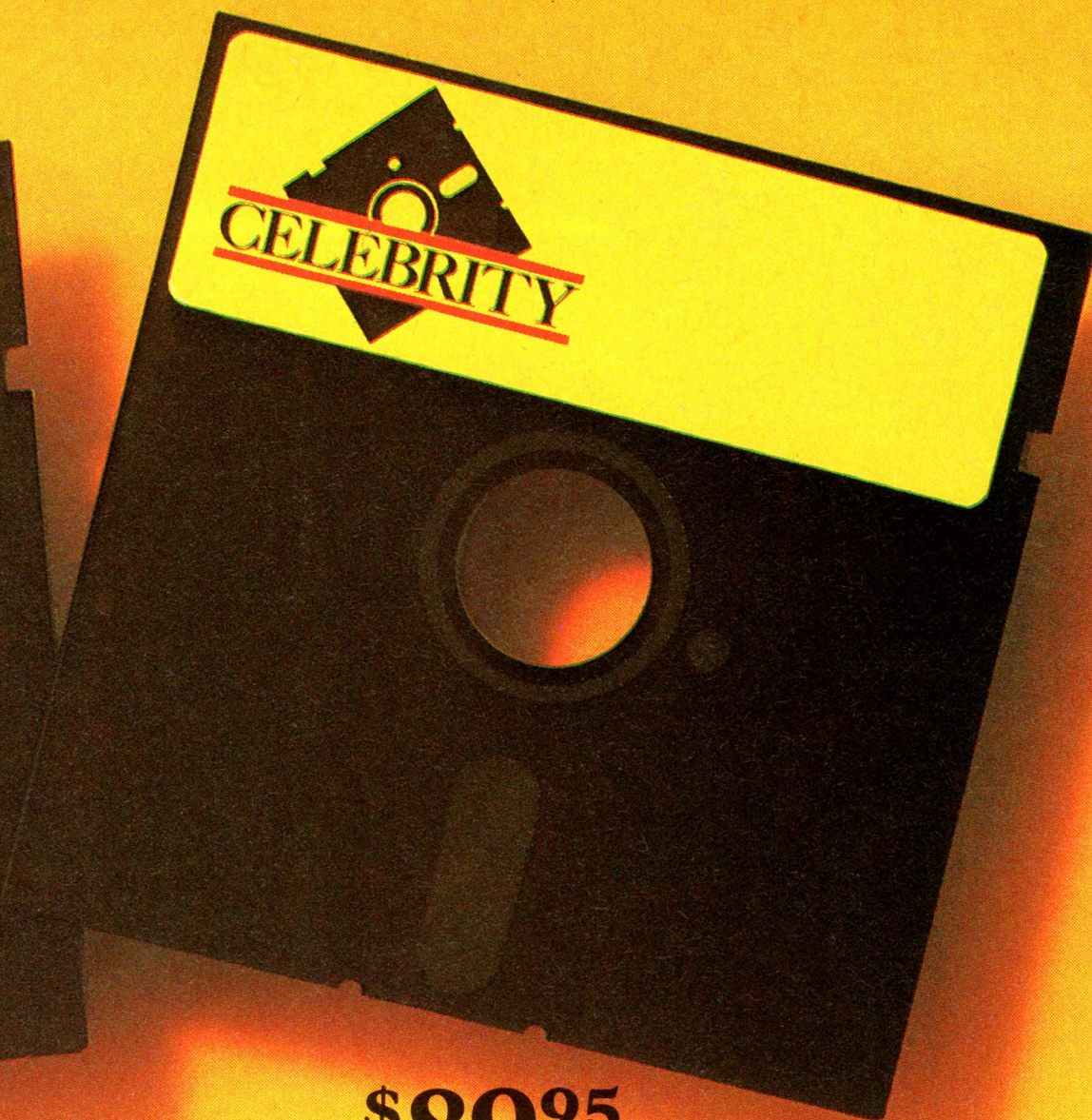
Sales Calls from anywhere in the country, (512) 339-6962, Technical Support Calls, 1-800-624-9896 or PC's Limited BBS (512) 339-4127

Customer Service Calls, 1-800-624-9897 or MCI MAIL: PC's Limited, Telex No. 9103808386 PC LTD FAX (512) 339-6721

(For More Information Circle 93)



\$400⁰⁰



\$89⁹⁵

If the features are the same, which word processor would you buy?

This is the good news you've been waiting for. Celebrity™ has all the features of high priced word processors for less than one fourth the cost.

Excellent Word Processing

Celebrity gives full word processing capabilities plus the ability to create your own commands and to perform functions with keystroke, command name or menu options. Work in up to 4 windows simultaneously. Move, transpose, copy and delete by word, line, sentence or paragraph.

What You See Is What You Get

There's no second guessing with Celebrity. You get the same text and format on the printed page that you see on the screen.

Easy To Learn and Easy To Use

For the infrequent user there is no need to remember special keystrokes. Celebrity can operate in plain English. With Celebrity's tutorial and help screens, you can save hours of training time. For the power user we've built in keystroke short cuts, macro and

command file capabilities. Celebrity. You won't outgrow it.

Extra Bonus

Celebrity includes a spell checker and thesaurus by Merriam-Webster and a full function calculator for business, science and programming. Plus an appointments and reminder calendar, a file cabinet capability, and a forms and reports system that includes mail merge functions.

You Can't Lose

With its low price, full features and a 30-day money back guarantee, Celebrity is too good to pass up. At only \$89.95, you can buy enough copies of Celebrity to cover all your home and office word processing needs. Available for IBM® PC, XT, AT and compatibles. 256K.

For immediate response call toll free to order

1-800-272-GOOD

In Texas or for information call
214-239-6085

IBM is a registered trademark of International Business Machines Corporation

(For More Information Circle 72)

Please send me Celebrity!

# Copies	Price	Total
_____	× \$89.95 =	_____
Add Shipping	+	\$ 7.50
Texas residents add \$5.51 sales tax per copy.		
TOTAL		_____

☐ Check ☐ Money Order
☐ AMEX ☐ VISA ☐ MasterCard

Account # _____

Expires _____

Name _____

Company _____

Street Address _____

City _____

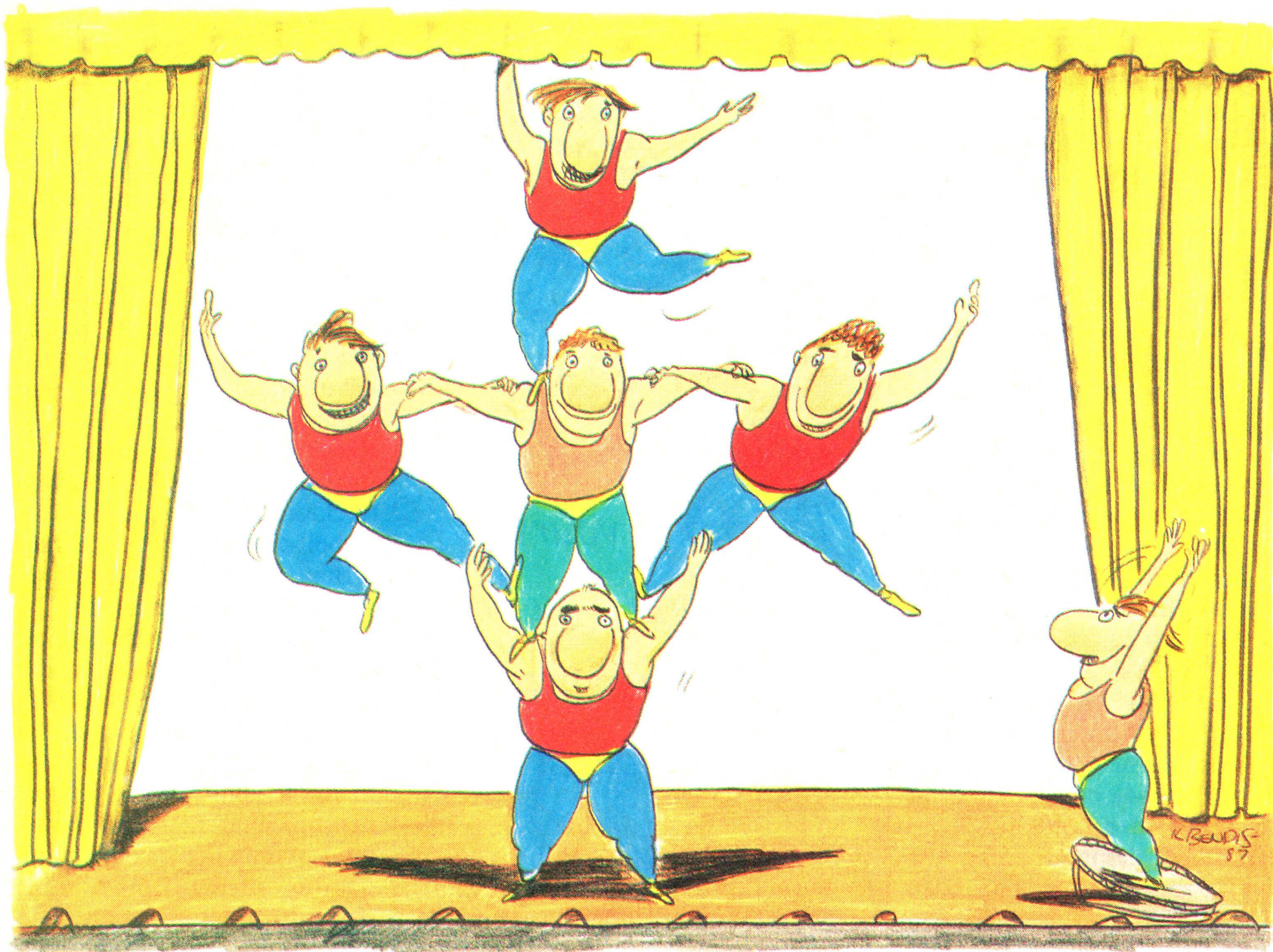
State _____ Zip _____

Phone _____

Signature _____

GOOD
SOFTWARE CORP.

5429 LBJ Freeway, Suite 720 Dallas, TX 75240



KEITH BENDIS

RAM RESIDENTS FOR THE ENLIGHTENED

One RAM-resident program may work miracles; several together can try the patience of a saint.

by Robin C. Nelson

You got RAM. I got RAM. All God's children got RAM. Yes indeed, specifying "640k on the motherboard" (for IBMs and compatibles) these days is about as exotic as making sure your new car comes with a radio. Why, if you shop around a little, you even find dealers who throw in the last 128k for free, to nail down the sale.

Yet, just having 640k of memory installed—plus maybe a meg or so on

the side in a memory expansion board—and using it productively are two different things. Very few mainstream, stand-alone application programs use all of 640k. The extra? That just sort of dangles from your saddle horn.

Unless, that is, you are either an MSU (Mammoth Spreadsheet User) or a successful experimenter—more later on

Robin C. Nelson is editor of CONSUMERS DIGEST and a multi-RAM-resident user.

why that is the appropriate terminology—in RAM-resident software. This kind of software, which programmers call TSR—for “Terminate, Stay Resident”—has only recently exploded into the vacuum of the average user’s RAM overhead. Its proliferation proves a point: Anybody who claims to have “enough” memory isn’t using it right.

Back when the MS/PC-DOS software developers were rushing out their various Major Solutions for word processing, spreadsheets, data bases, and asynchronous-type communications packages, they fixed on a target market of new users in what was then the ultimate environment: an IBM PC with the 128k RAM option—“loaded,” in a word. Thus, the winning entries (many are still earning their keep) were almost all comfortable in those cozy quarters; and some, like WordStar and dBase II, were straight translations of CP/M programs that had originally been taught to get along within the—imagine!—64k confines of 8-bit hardware. Then, when Lotus 1-2-3 and dBase III dared demand 256k, the known Universe seemed to have been plumbed. Other software authors who could figure out ways to upgrade their programs into 256k, presumably with some added performance, did. Many couldn’t justify it, and were honest enough not to. All was well—that is, until 1984.

Enter Borland’s SideKick—not the original attempt at providing a set of RAM-resident “desktop” utilities for IBMs and compatibles, but the first with enough marketing clout to catch on in a big way: To load the full set of SideKick utilities—notepad, phone dialer, appointments calendar, and calculator (the ASCII table is only to leave on the screen for effect when you step out of the office)—on top of a big applications package, you immediately needed 56k more than the 256k most of us had. And you went out and got it the day after the guy at the next desk showed you all those handy accessories popping up on his monitor.

Desktop utilities are fine, but there are other—sometimes better—ways additional memory, whether it’s in usable RAM or an expanded chipset out of the direct grasp of DOS, can be invested for profit: If you’re involved with disk-intensive text searching or data base operations, for example, virtual disk partitions (RAM disks) or cache buffers will pay you back in significantly accelerat-

ed operations—even on hard disk systems. And for getting the cursor quickly around in any kind of graphics or text screen, you may want a mouse driver in RAM, plus a mouse command “menu” for the specific application you’re running. For heavy keyboarding, on the other hand, a neat foot-pedal accessory called the PC Pedal takes a minuscule

*Insist on seeing
the software work
on a system that
resembles yours.
Otherwise, you are
buying the virtual
pig in a poke.*

chunk (under 10k) of RAM in exchange for the ability to put the Alt, Ctrl, Shift, or any other key underfoot to speed data entry in spreadsheets and data base screens as well as word processors.

Thus, performance enhancers now vie actively with desktop utilities in competition for “spare” RAM.

At the same time, IBM (TopView) and Microsoft (Windows) have spent good money trying to convince us that the best possible use for abundant RAM is to harbor a resident (DOS shell) “environment” that permits concurrent operation of multiple software programs. They spent and still spend, but users generally aren’t buying. (Quarterdeck Systems, which may actually have come closer to some of the same objectives than the biggies, with its Desqview and Desq variants, about got lost in the shuffle.) The multitasking DOS shells grab RAM in bunches—130- to 160k—with a payoff limited to use of “well behaved” applications that fit comfortably in remaining memory and thus tend to be either painfully slow or minimally functional. The heck with that. We didn’t pay for a Porsche so we could drive it at 55mph. In addition, it usually turns out that we only need a certain amount of concurrent access to preloaded programs plus a data transfer (cut-and-paste) facility, not true concurrent processing (namely multitasking), for which the demand in software dem-

onstrations far exceeds that of the average workplace.

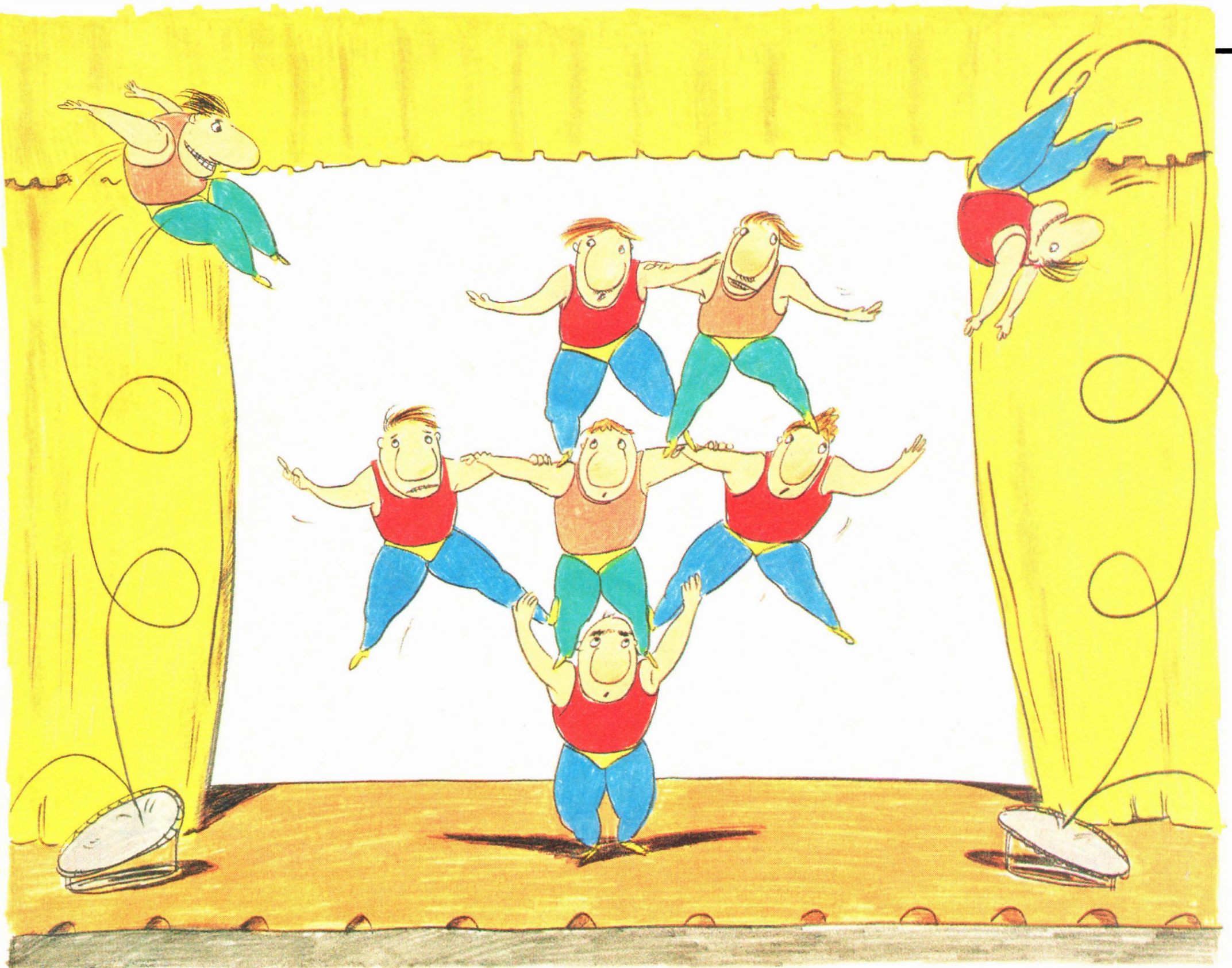
Another rap on the DOS shells is that they didn’t anticipate and therefore don’t readily accommodate the profusion of other TSR utilities. “Microsoft Windows was written with no thought of other RAM-resident programs,” asserts Stan Brin, president of Software Research Technologies, which makes the SmartKey macro generator, “as if they had blinders on.”

Now, contention for memory space is coming from a newer strain of TSR variants: RAM-resident programs that behave exactly like stand-alone applications and, in fact, can replace them. Recent entries have included programs for: business graphics, communications (including mainframe links), outlining, a spell-checker and a thesaurus, print formatting, financial analysis and, of course, RAM management.

There are, however, certain considerations—or let’s come out and call them reservations—any computer user must examine before assembling a RAM-resident support package to complement the applications that make his or her machine more productive. Foremost among them is the whole general question of the compatibility of TSR software programs with both present and future computers, peripherals, operating systems, programming tools, mainstream applications, and, last but not least, each other.

To a computer user, the magic of RAM-resident software is in its ability to effectively disappear, apparently clearing the system—or at least the screen—for unimpeded operations within a completely different software regime, and then to reappear instantly when called, ready to perform again. Far too often, however, when TSR programs are loaded and called up in combination or with applications that are written to sidestep certain DOS requisites, the computer will suddenly and unpredictably “hang up.” The only course is to reboot, taking whatever lumps come in loss of data and arrested productivity.

Why this happens is linked to some very technical underpinnings of both the IBM PC’s Basic Input-Output System (BIOS) and the way Microsoft designed the MS-DOS operating system. Because Microsoft has not published documented procedures for tying TSR programs to its MS-DOS (see related story), almost every effort to date made



THE ACROBATICS OF LOADING

The sequence in which RAM residents take their position in the computer is crucial.

by the 100-odd companies involved in actively producing RAM-resident software represents a programming team's "best guess"—including those being successfully marketed.

Ed Tolson, the president of SoftLogic Systems, a New Hampshire software company that has published a study of TSR programs, calculates: "Perhaps one out of 10 existing packages is actually coded correctly for the way DOS expects it to perform."

In addition, variations in the way certain compatibles' ROM chips emulate the proprietary IBM BIOS can cause them to reject TSR software that runs on other machines. SmartKey's Brin targets Zenith as one computer marketer with that problem; "Thousands of them have been returned to dealers to have changes made," he says. It doesn't end there, since there are even TSR compatibility variances between IBM PC versions. Because of a new keyboard, for example, one best-selling key-redefinition program will not run on IBM PCs sold since January 1st.

Given these circumstances, and in the simplest possible terms, "crashes" can

be said to occur primarily because the first requirement of any RAM-resident program—whether it generates keyboard macros, pops up a calendar, or references a 110,000-word thesaurus—is *not* to disappear from the system. On the contrary, it must perpetuate itself by notifying the computer's central processor of its memory "address," in effect securing squatter's rights to the portion of memory it occupies. It must also present its address at key locations in the BIOS called "Interrupt Vectors," through which the keystrokes that call it to action will pass.

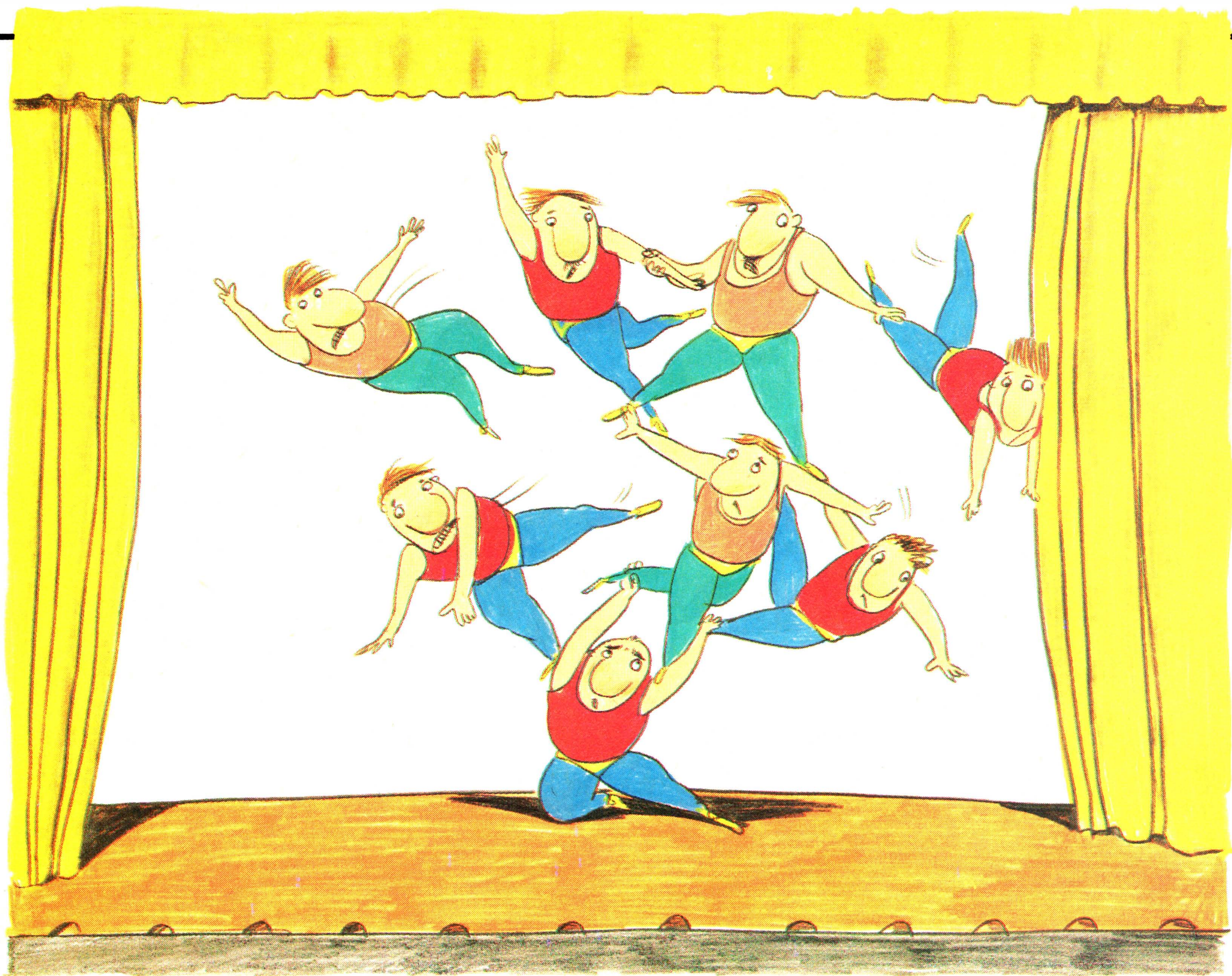
When a RAM-resident program trying to sit on the appropriate Interrupt Vectors and attract attention to itself has competition, problems are not far away. Most often, they occur when another TSR is in residence, but not always, nor is it a prerequisite. The Basic programming language shipped with MS-DOS packages, for instance, will simply not live together with most RAM-resident keyboard redefinition programs.

An "aggressive" RAM-resident program, one designed to intercept key-

strokes at the earliest possible point (known as Interrupt Vector 9 in IBM PCs), can be instructed to "nag" the CPU every time the computer's 50-millisecond clock ticks—20 times per second. In the process, it can often overwrite anything that is in RAM with it. Then, if the CPU is unable to contend with the conflicting instructions and illogical "holes" in memory, it goes into fibrillation. And the monitor screen—our only window into the process—immediately becomes, as they say in the Emergency Room, "fixed and dilated."

Software developers call this syndrome "RAM-cram." The poetic term is somewhat misleading, since the total amount of RAM occupied by the offending programs seems not so critical as the number and types in simultaneous residence, the quality of the individual codes (programming) and, sometimes, the sequence in which they are loaded. If you experience RAM-cram repeatedly in trying to load and work with several TSR packages, take a long, slow breath, get out the documentation, and do the following:

Check the loading sequence. Keyboard



WHEN POP-UPS COLLIDE

RAM residents that try to occupy the same space in memory will cause the system to crash.

redefinners should generally go into RAM ahead of anything that follows, so they can be "boss." Other TSR programs may specify loading in a certain position or sequence relative to others. Borland's SideKick is notorious, at least among competitive software developers, for demanding to go into RAM last—from which position it camps on Interrupt Vector 9 and wreaks havoc with anything not capable of protecting itself. Even if the documentation for your program doesn't specify a loading sequence, it may still be a critical factor, so, if problems persist . . .

Shuffle the loading sequence. Do it first while protecting the preferred positions of those programs that specify one. Reload for a trial run; if the system still hangs up, try any and every combination—including those in which SideKick may not be last through the gate. Below is a batch file I evolved through trial and error and now use regularly to load my word processor (WordStar) to a RAM disk (Drive D:), along with the SuperKey macro processor, a special WordStar menu ("ws") for the Microsoft Mouse, SideKick, Webster's New

World Thesaurus, with its dictionary placed on the RAM disk, and lastly, the foot-pedal activator.

```
CD\WS
COPY \WS\WS*. * D:
CD\MOUSE
MENU WS
CD\KEY
KEY WS/M1
CD\SK
SK
CD\WS\THS
WTH -RM=D: -CR=N-I
PC PEDAL
D:WS
REFEREE ##
```

Putting in SideKick ahead of two other residents was the key; it goes against the Borland directive, but what the hell, they'll never find me in this corner of the galaxy . . . This setup lets me boost WordStar (version 3.31) with Alt-key combination macros so that it behaves like a full-featured, modern word processor; it gives me an instant thesaurus (via Ctrl-F6) with one-keystroke substitutions and, not at all least, it lets me use SideKick's calendar and calculator, plus its notepad to look at or import files from subdirectories that my old version of WordStar doesn't

recognize—I can even edit on a split screen, since SideKick's word processing command set is nearly identical to WordStar's. The foot-pedal program lets me assign the Alt, Ctrl, or Shift keys to my left foot—so I can jockey all the previously loaded capability around a little better, or just input faster if that's what I need to do. The last command operates after WordStar is exited and it cleans out RAM for the next job (more about this later).

It has not crashed, ever, on my (ITT Xtra) system—and note that the RAM disk driver itself, the Microsoft Mouse driver, and a cache-buffering program called FXP (proprietary to ITT) are already installed into RAM and Expanded RAM by the CONFIG.SYS file before this sequence even begins. So in spite of the perils, RAM can be thus crammed, without incident, if you find the right combination. But if you don't, then . . .

Isolate the offender. Subtract individuals, one by one, from the TSR group you are trying to load. There are clones now available for almost all of the popular TSR utilities, providing similar if not identical functionality, and what are ap-

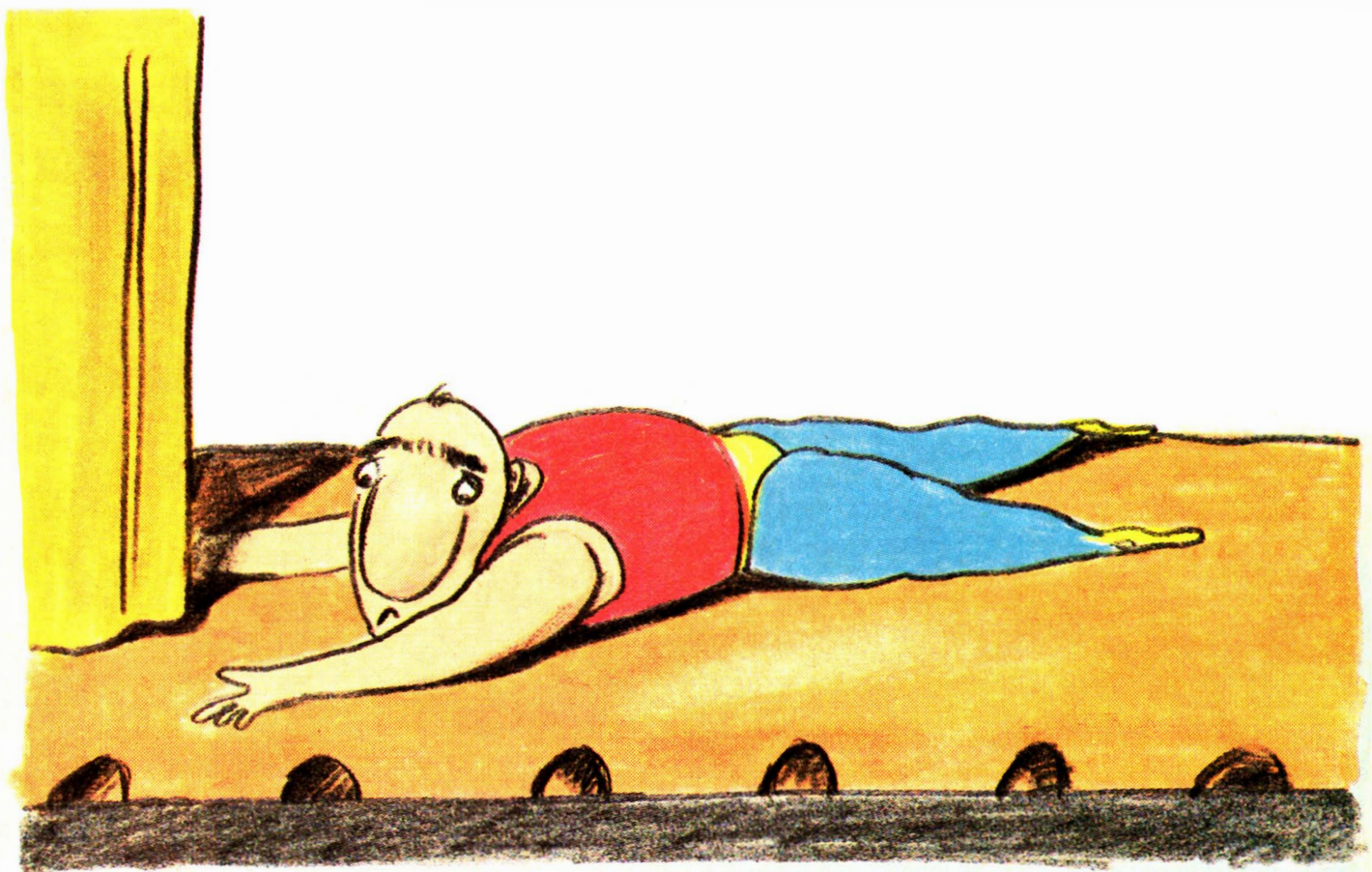
parently vast differences in the way they are coded may be the key to building a crash-proof assembly. If you use cache buffering or a DOS accelerator, try booting without them as well. But you still have another choice . . .

Go Borland. SideKick will collaborate wonderfully well with its TSR house-mates, and every day, it seems, there are more of them. So if your operational needs are fairly text-oriented and don't extend beyond a keyboard macro generator including a cut-and-paste module (SuperKey), speller/thesaurus (Turbo Lightning) and the desktop utility set, Borland will take your order and cram your RAM—the three loaded together will require from about 150 to as much as 360k RAM, based on a full SideKick menu and depending on Turbo Lightning's dictionary configuration options.

Those who produce a typical assortment of business-type communications should find the above assemblage more than adequate—the proofreader operates on any text-based data entry, not just word processing. Professional writers may prefer to have full-file, rather than Turbo Lightning's by-the-word or screenful spelling checks, and a thesaurus more conducive to exploring synonym chains than its basic prompter. A batch file that puts the all-Borland TSR package to work with my WordStar on a RAM disk is shown below. (You'll need at least a 512k RAM disk to be able, as I am, to put the full, hard-disk versions of Turbo Lightning's dictionaries into it, along with the WordStar program files, for by-the-word proofreading.) I keep my Mouse menu installed mainly for fast-cursoring to the misspelled words Turbo Lightning highlights in screen-scanning mode.

```
COPY \WS\WS*. * D:
CD \MOUSE
MENU WS
CD \KEY
KEY WL /ML
CD \LIGHT
COPY DISK.DIC D:
COPY THES.DIC D:
LIGHT
CD \SK
SK
D:WS
```

Close readers will note, I trust with interest, that the SuperKey macro file for WordStar—designated as “wl”—is a different one from that loaded as simply “w” in the first batch file. This is because Turbo Lightning uses as “hot” keys (or activators) several Alt-plus-function-key combinations I normally use as SuperKey macros with WordStar. To use Lightning and SuperKey together, I have to remove those as working macros—hence a separate file, differ-



A STANDARD FOR ALL?

The status of “Terminate, Stay Resident” software is, in the words of one software author, a “three-ring circus.”

The primary reason is the lack of standards for coding TSR programs to interact with MS-DOS. Because Microsoft has kept the DOS interface (interrupt handling) procedures a trade secret, every software developer takes his best shot. Some work well and don't crash computers; others are hopelessly incompatible and have had to be extensively overhauled after release because of the problems they cause.

The closest thing to a standard has been created by Borland International of Scotts Valley, Calif., the company that popularized the TSR concept with SideKick. Borland's products essentially grab the optimum position to be ready for keyboard entry, and then blow other programs (and sometimes the system) away. They do it via Interrupt Vector 9, which is the earliest possible point at which keystrokes can be intercepted.

Because of the problems caused by a lack of standards, a Colorado Springs, Colo., software company, Softronic, decided to write a “kernel” providing a single handle everyone could use to put TSRs into a DOS system without their interfering with one another. Last May, Softronic sponsored a conference to explore the idea. About 100 companies attended.

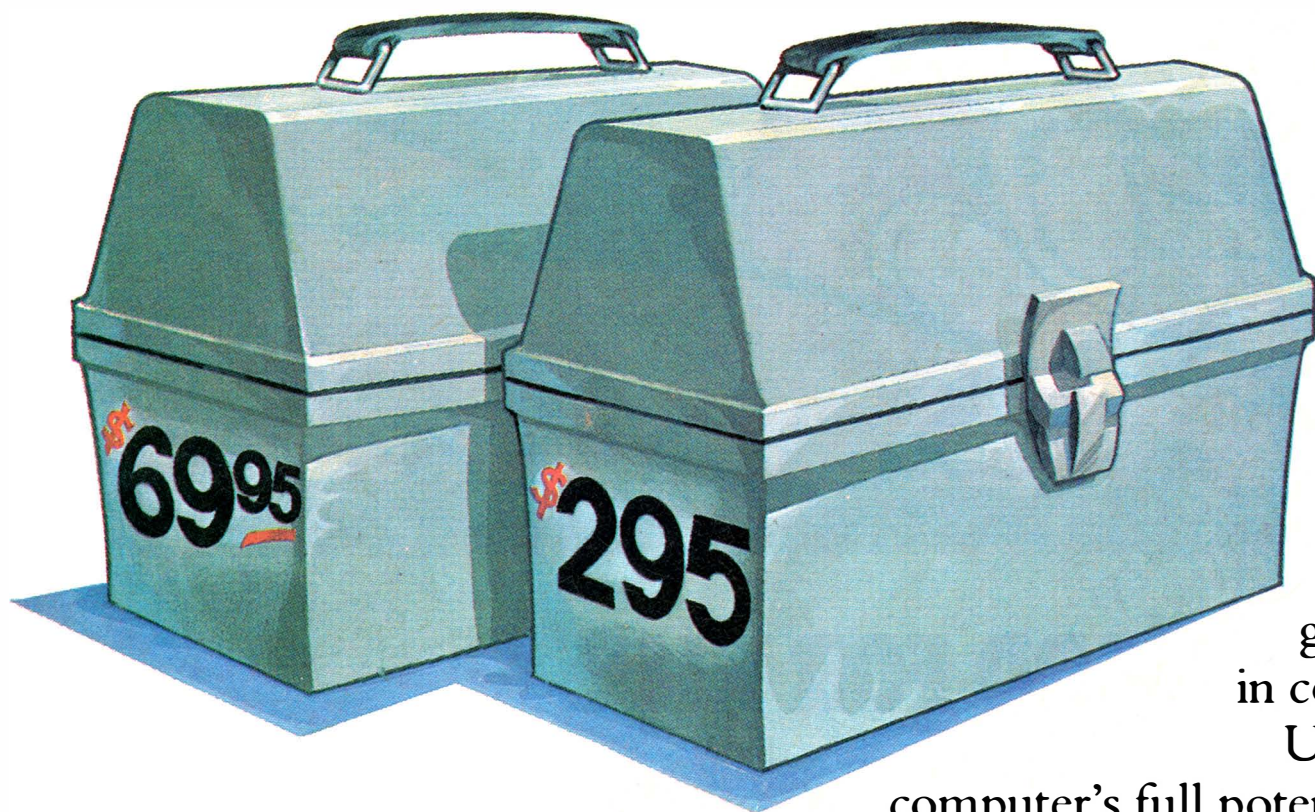
By the close of the conference, Microsoft had agreed to publish handles to DOS within three months while Borland and Rossoft, which makes ProKey, had agreed to produce a public domain Interrupt 9 handler within three weeks. Developers hoped that a standard would emerge from those two and the Softronic kernel. But neither the Microsoft nor Borland-Rossoft agreements have been kept.

Borland says its part isn't done because of “logistical” problems and because the company is still considering the proposal. Microsoft says it's still working on the DOS handles, intends to make them public, and apologizes to other developers for the delay.

Some companies, however, are tired of waiting. Chip Rabinowitz, director of software engineering for American Video Teleconferencing Corp. of Long Island, N.Y., is among those going ahead. According to Rabinowitz, a coalition of authors is producing a Ringmaster interrupt handler to tame the three-ring circus of TSR programs. Their efforts will result in a device driver that should be available by the spring of 1987 for a registration fee of \$25. Since all software written for it will have to be free/shareware, though, it's unlikely the standard will become widespread.

—R.N.

HONESTLY. THERE IS NO FREE LUNCH.



And even if there were, you couldn't afford it. Not when it comes to getting help with your taxes. What you save now by buying an inexpensive tax preparation program can end up really costing you later.

Only Tax Preparer® by HowardSoft® gives you the tax break you have coming. Other programs look like glorified calculators in comparison.

Unlike the others, Tax Preparer puts your computer's full potential to work for you. Simply and easily.

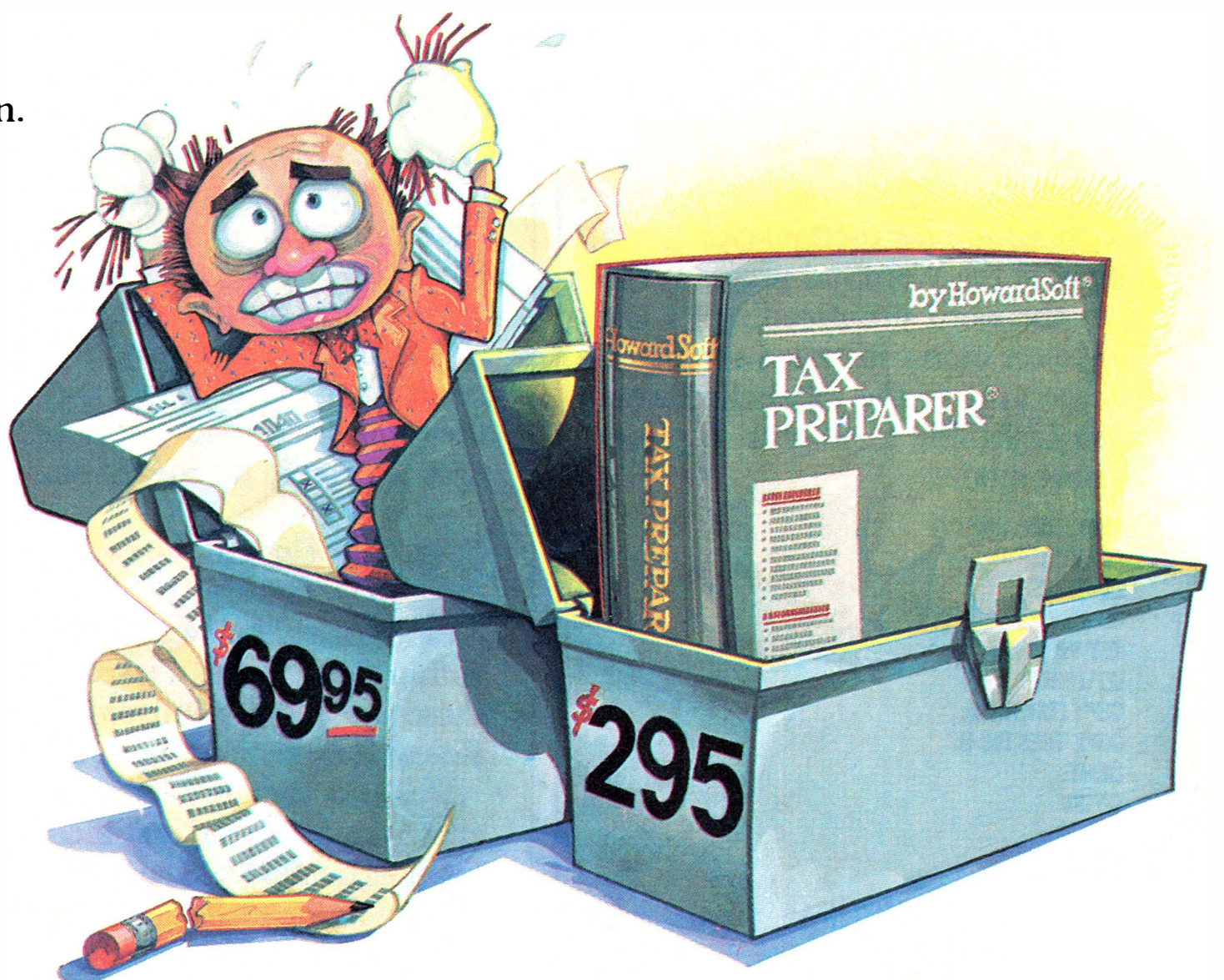
It learns the tax forms to the letter, so you don't have to. It makes sense out of confusing credits and deductions, reveals tax opportunities, and helps protect you from making entries that don't conform to the latest tax laws. And it gives you added protection by performing not just some calculations, but all of them.

Tax Preparer is not only smart, it's organized. Make one change and it's reflected throughout the entire return. You end up with a finished document, printed out in IRS-accepted format, ready to drop in the mail. You won't need to labor with handwritten additions or corrections. All this on your IBM-PC, IBM-compatible, or Apple II Series Computer.

And best of all, it's blessedly easy to use.

No other program can give you even a taste of all this.

So, just stop by your favorite dealer for a demonstration. And remember. Pay a little more for HowardSoft and get a return that's a whole lot easier to digest.



HowardSoft®

**The software investment
you can count on.**

1224 Prospect Street, Suite 150, La Jolla, CA 92037 (619) 454-0121

Ask your dealer about Tax Preparer's California State Supplement and our Partnership Edition.® Plus Real Estate Analyzer.® All from HowardSoft.

IBM is a trademark of International Business Machine Corporation. Apple is a trademark of Apple Computer, Inc. HowardSoft, Tax Preparer, Partnership Edition and Real Estate Analyzer are trademarks of Howard Software Services.

ently named. This touches on an irony anyone out on the TSR frontier is familiar with: getting a bunch of things jammed successfully into RAM, only to find there is a keyboard conflict.

Do not, henceforth, ever become dependent on any TSR program that does not offer redefinable hot key(s); and a "kill" switch that will cleanly excise it from memory without leaving a puncture wound, so you can reclaim that space for your own devices, without your having to reboot the system.

Rebooting merely to clear memory belongs in the Neanderthal Age. Some of the older utilities that could not be removed without rebooting, however, can now be controlled by programs that can manage your RAM.

Referee, from Persoft, is one of them, and it may be somewhat overelaborate in offering both resident and nonresident versions for monitoring, activating, and deactivating all other RAM occupants (provided they are loaded after Referee). But if you'd rather use batch files than slug away at the keyboard to move the programs around, Referee is worth having for one feature alone: It gives you the opportunity to write a one-line batch file command that will blow all attendant RAM residents right out of memory anytime you exit the application initially called up by the same batch file. You don't have to use this approach, which does involve reloading resident utilities each time you switch applications; Referee can also instantly activate and deactivate selected programs (that remain resident) in preloaded "RAM teams" based on what you assign to each of your applications. But you don't retrieve the memory space occupied by a Referee-deactivated program and I find the clean slate/batch file method better.

Yet another approach is used by Softlogic Systems' Software Carousel; it creates discrete DOS partitions into which both resident and nonresident programs can be concurrently loaded. Unlike the multitasking DOS shells, however, Carousel has a "virtualization" feature that enables users to load programs with a total RAM requirement well in excess of that residing on the system. When these are then interchanged, the "overage" is swapped out to a predesignated space on the hard disk. Under this system, multiple replications of the same TSR program can reside in separate partitions, configured

POP-UPS FOR ALL OCCASIONS

The new breed of RAM-resident program (called TSR by programmers, for "Terminate, Stay Resident") is like an application program in itself. Though it resides in the background of other programs and must be called up via a hot key, this kind of program is more than a simple utility. Here's a sampling of the various kinds of TSR programs now available.

FINANCE 10 Offers 10 separate modules for use by financial counselors, accountants, and other professional types; includes loan amortization, lease vs. purchase, internal rate of return, future vs. present value, plus common statistical calculations (average, mean, standard deviation, etc.); includes depreciation schedules based on the new tax law. The RAM required is 128 kilobytes. The price is \$149. *Creighton Development Inc., 16 Hughes St., Irvine, CA 92718; (714) 472-0488 (For more information, circle 360).*

GRAPH-IN-THE-BOX Latest version, 1.2; enables user to instantly create business graphics (choice of 11 different chart formats) by evoking the program with numerical content on-screen and marking the block of data to be graphed. Graphics files can be saved for printing; works with word processors, data base managers, spreadsheets. The RAM required is 128k. The price is \$97.60 copy protected; \$147.60 non-protected. *New England Software, Greenwich Office Park 3, Greenwich, CT 06831; (203) 625-0062 (For more information, circle 361).*

INSET 2.0 This is the updated version of a program that permits merging of graphics files (images, signatures, graphs, charts, etc.) with text files for output on a wide range of dot matrix or laser printers. New features include on-screen preview of the merged images, and a graphics editor. [See review in this issue.] The RAM required is 32k. The price is \$99. *American Programmers Guild, Ltd., 12 Mill Plain Road, Danbury, CT 06811; (203) 794-0396 (For more information, circle 362).*

READY Outline formatter from the makers of ThinkTank can be used in conjunction with word processors; early versions had problems coexisting with other TSR programs but publisher has made necessary changes. The RAM required is 128k. The price is \$99.95. *Living Videotext, 2432 Charleston Road, Mountain View, CA 94093; (415) 964-6300 (For more information, circle 363).*

RELAY GOLD A heavy-duty communications package with a resident mode (includes unattended operation) with controls for allocating both RAM and CPU processing time (percentage) between Relay and other operations for optimum system configuration; available as Relay Silver (\$150) without mainframe-linking feature. The RAM required is 192k. The price is \$250. *VM Personal Computing Inc., 41 Kenosia Ave., Danbury, CT 06810; (203) 798-3800 (For more information, circle 364).*

(For more information on all the products listed above, circle 365)

—R.N.

differently (a different macro file, personal dictionary, etc.), and they will be available via a single keystroke.

When you gain access, however, the program is exactly as you left it—with whatever TSR aids that go with it standing ready. Softlogic president Ed Tolson calls this "everyman's multitasking"—not true concurrency, but instant access to multiple programs. Software Carousel requires debugging—a code patch—to run on some compatible systems. The company is also readying Shear Power, a cut-and-paste utility that will provide a dimension of fast data interchange between partitions.

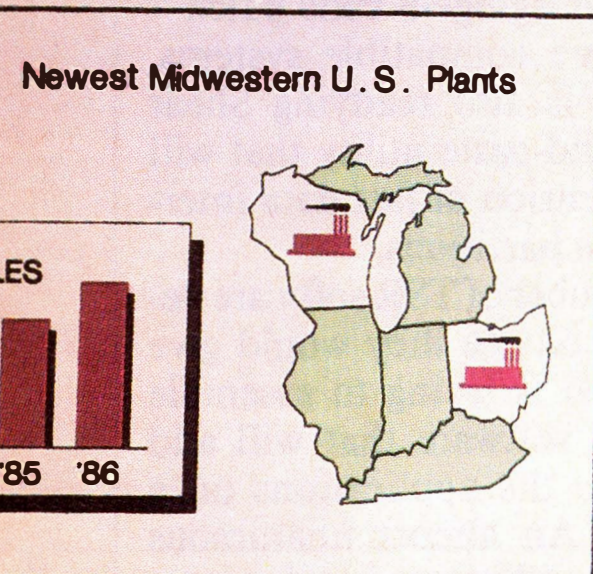
I asked a number of TSR software developers what advice they would give the person who is trying to assemble RAM-resident software that will add productivity to the applications on a given system. An almost unanimous first priority was that you insist on seeing the software demonstrated, before purchasing it, on a system that resembles the one on which it will be installed as closely as possible—down to RAM configurations, device drivers, print buffers, etc.—as well as in concert with the same applications software that will run on the system. Otherwise, you are buying the virtual pig in a poke.

The one most interesting observation came from Chip Rabinowitz, director of Software Engineering at American Video Teleconferencing Corp.: "I hate to say this, but counterparts of almost all commercial TSR programs are available in the form of 'shareware' you can download from, say, the Special Interest Group on CompuServe."

If commercial TSR software is properly coded for DOS only 10 percent of the time, I wondered, how good can shareware be? Rabinowitz, however, is emphatic. "Most of the people who are writing commercial TSR software," he says, "learned how to do it by writing shareware; in general, it's as successful—or unsuccessful—as the packages you can buy."

A number of other software authors feel that TSR performance will be enhanced in the future by the development of a standard interface with DOS. As for Microsoft's DOS itself, the best guess is that an upcoming version will include a standard—but no one would rule out the possibility that current TSR software will be made obsolete by it.

All these considerations aside, TSRs are definitely here to stay . . . and disappear . . . and return, at the tap of a key. For doing specific computing jobs exactly when you want them done, there is no better way. ■



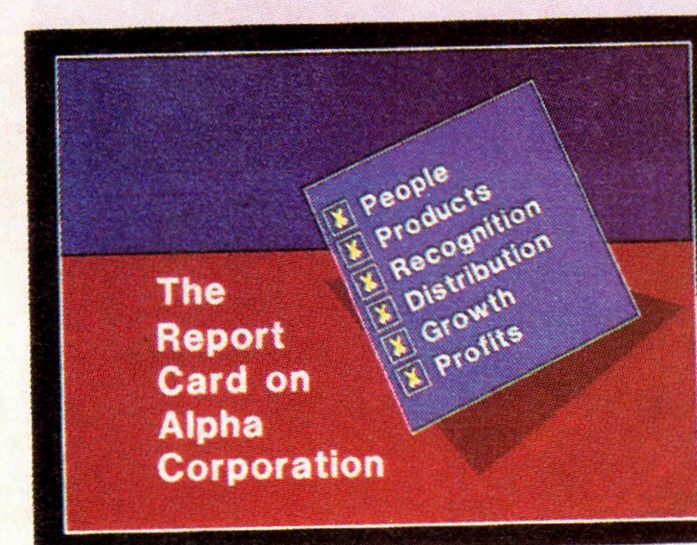
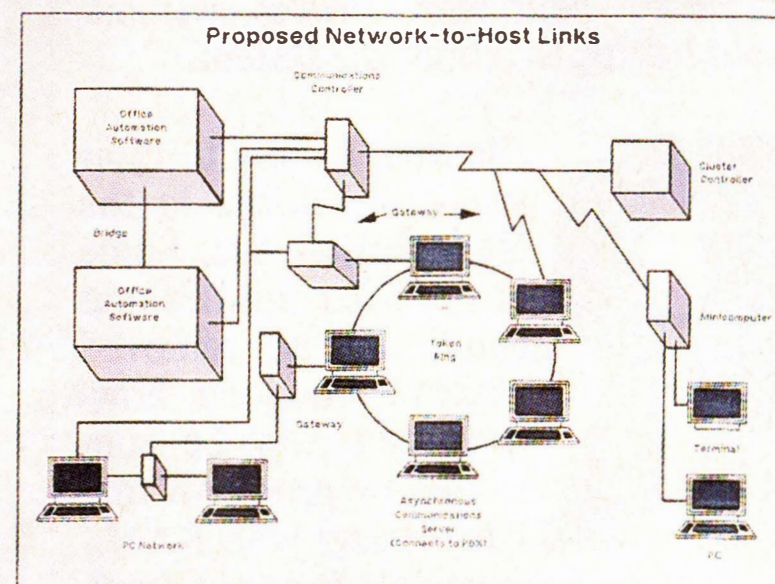
From the Desk of
Jonathan Smith
Manager, ESD Division

PRIORITY	ITEM	RESULTS
1		
2		
3		

NOTES

Activity Planner

NOVEMBER						
SUN	MON	TUE	WED	THU	FRI	SAT
		1	2 Site Prop.	3	4	5
6	7 Tokyo	8	9	10	11	12
13	14	15 Dallas	16	17	18	19
20	21	22 Prod. Eval.	23	24 Thanks giving	25	26
27	28	29	30			



Customer Service Dept.
Metro-Manufacturing Group, Inc.
2501 W. Shawmut Blvd.
Chicago, Ill. 60649

Bulletin for March / April 1986

New Phone System

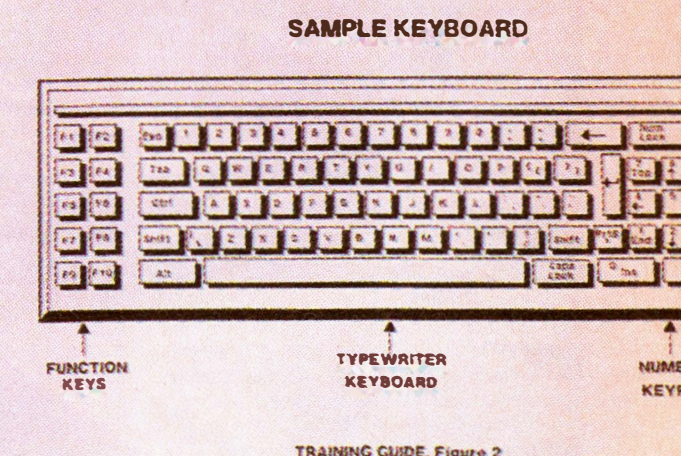
Following our department's decision to upgrade our phone system to handle the growing volume of calls, we have selected a new system. This new system will allow us to handle more calls efficiently and will also provide us with a more professional appearance. We will be installing this system by June 1st.

New Supervisor

We have a new supervisor with the Metro-Manufacturing Group. His name is Mr. John Doe. He will be taking over the supervision of the Chicago office. Mr. Doe has been with the company for 10 years and has a wealth of experience. We are confident that he will do a great job.

Good Work!

For the month of March, our sales were up 15% over last month. This is a great achievement and we thank all of our salespeople for their hard work. We will be holding a special party for the sales team in April to celebrate this success.



Lotus® always wanted to get into pictures. It was just a matter of getting the product exactly right. That's why Freelance® Plus is big news. It's a powerful graphics package for business that adds real punch, real impact to all your work. Whether it's memos, reports, forms, bulletins, schedules or full-blown presentations.

Freelance Plus works with many popular PC software packages. Like 1-2-3®, Symphony®, Graphwriter®, Freelance Maps and dBase®. Plus you can use it with programs like Lotus Manuscript™ to merge text and graphics into a single document.

Freelance Plus gives you all the graphics tools you need. Maps. Diagrams. Symbols. Standard business charts. Logos. Editing. For paper. For slides. For overheads. *All in one program.*

And the best part is, the more you use it, the more you'll discover you can do with it.

Freelance Plus. Designed to become the standard for business graphics. Because it allows you to picture what you're trying to say.

See your local authorized Lotus dealer for a complete Freelance Plus demonstration. To order a \$10.00 demonstration package, call 1-800-345-1043 and ask for GM-1658.

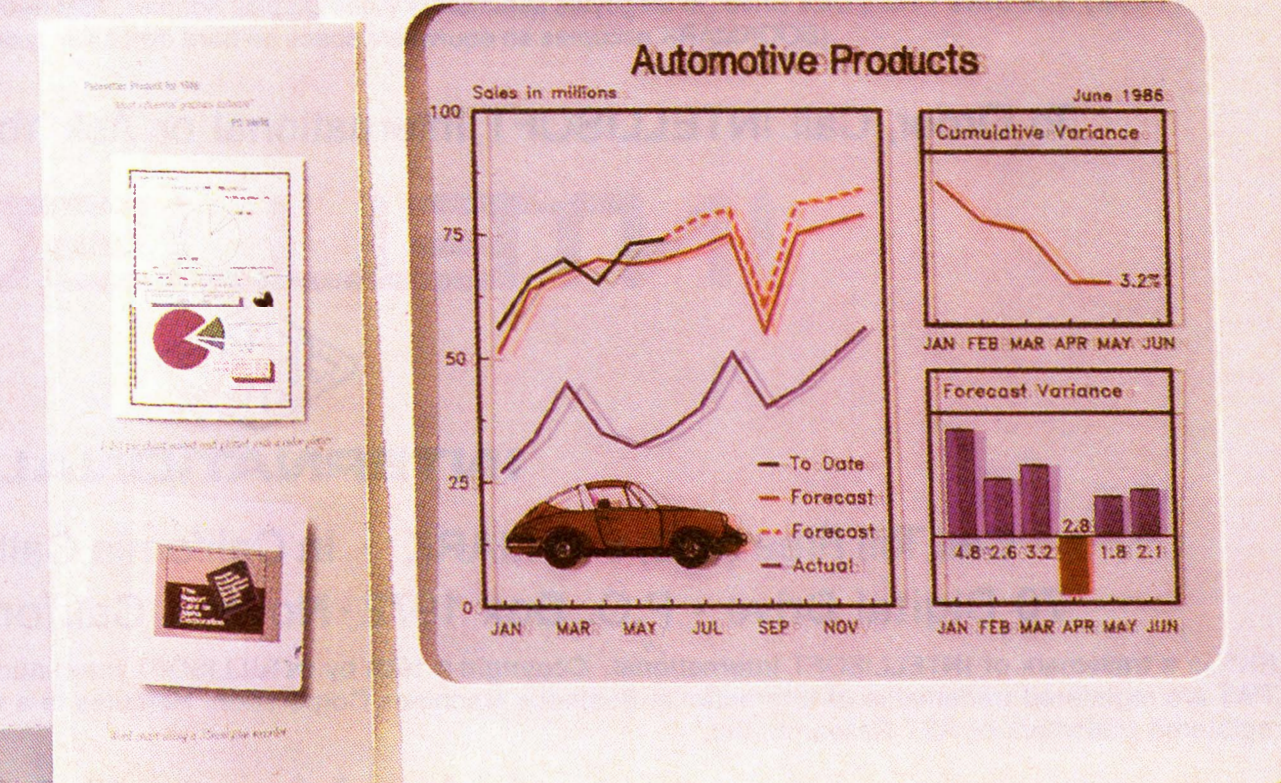
Lotus Freelance Plus

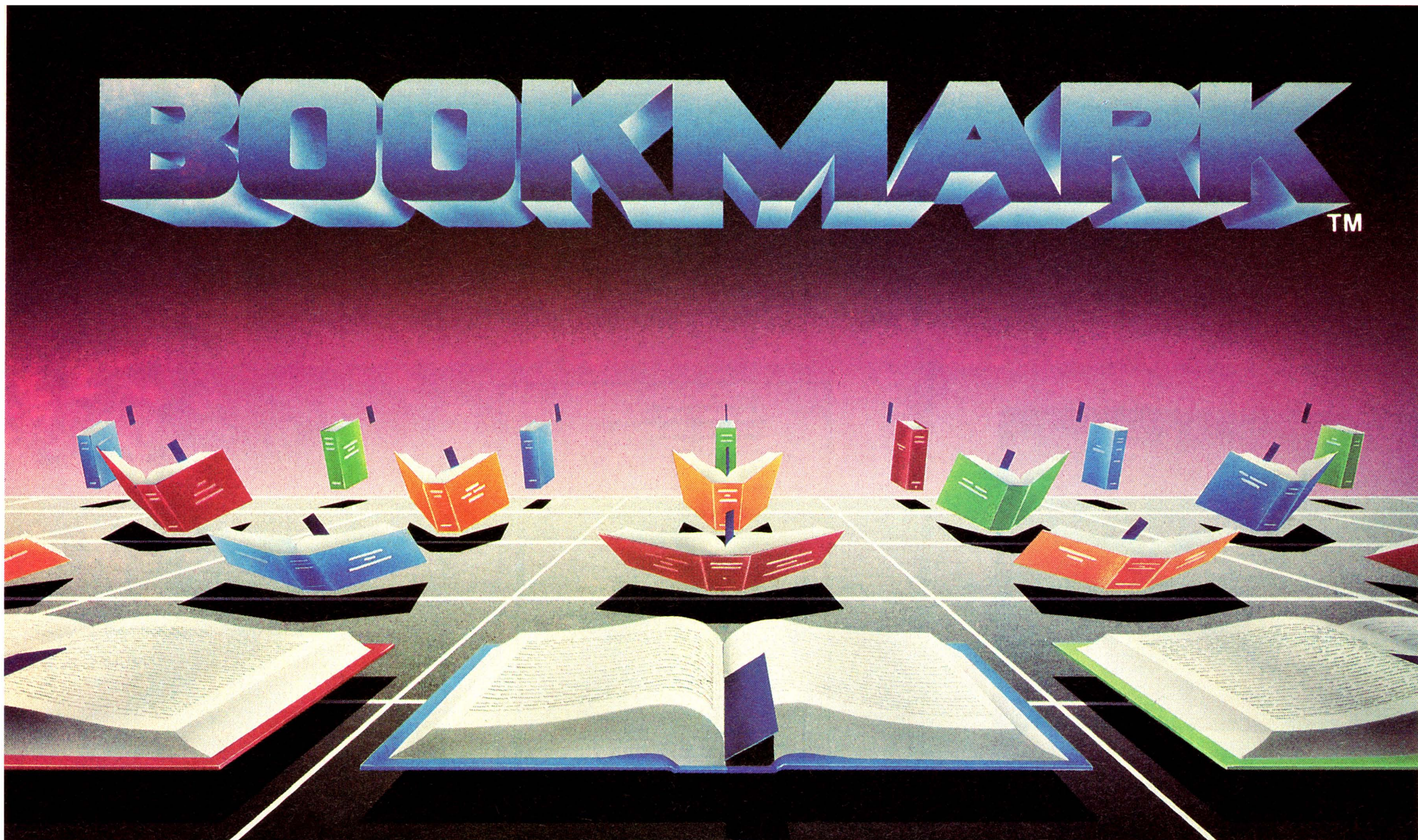
The one graphics product for presentations, reports and everyday business communications.

©1987 Lotus Development Corporation. Lotus, 1-2-3, Symphony, Freelance and Graphwriter are registered trademarks of Lotus Development Corporation. Lotus Manuscript is a trademark of Lotus Development Corporation. dBase is a registered trademark of Ashton-Tate.

One Program
charts, symbols
diagrams, etc., etc.

Overheads
+ Slides, too.





BOOKMARK™ Data Protection Software

Automatically marks your place so you can resume where you left off.

Runs with most software so if you decide to call it a day you can power down, and upon restart BOOKMARK will bring you back where you left off...it's like having a BOOKMARK in your computer!

Stop wasting time navigating through menus . . . or teaching novices.

Easy to use. You choose how often work is saved, by number of keystrokes or length of time.

Work in progress can be resumed within seconds after system crash, power failure, accidental reset or power down.

Costly battery backup systems are no longer needed when work in progress is already saved to the point of the previous BOOKMARK placement.

BOOKMARK is a memory-resident utility that automatically and periodically saves work in progress to a reserved area of the hard disk.

Suggested Retail Price \$69.95

Requirements:

IBM PC/XT/AT or 100% Compatible

64k to 640k

IBM DOS 2.1 or Higher

1 Floppy Disk Drive • Hard Disk Drive (10 Megabytes Minimum) • Video Display Adapter, IBM (Monochrome, Color, Enhanced Color), Hercules, AST
(BOOKMARK occupies an equivalent space on hard disk as in system RAM plus video RAM)

To Order, Call INTELLISOFT International or Ask Your Dealer for BOOKMARK

INTELLISOFT™



INTERNATIONAL

Call Toll Free (800) 544-MARK • In California Call Toll Free (800) 543-MARK

70 Digital Drive • P.O. Box 1972 • Novato, California 94948 • (415) 883-1188

BOOKMARK™ is a trademark of INTELLISOFT International. Copyright © 1986 by INTELLISOFT International. All rights reserved.
IBM PC/XT/AT are registered trademarks of International Business Machines Corporation. Hercules is a trademark of Hercules Computer Technology.
AST is a registered trademark of AST Research, Inc.

(For More Information Circle 7)

PERFORMANCE

HOW WELL DO YOU SPELL?

Spelling checkers can ensure your text is letter perfect, but not all are created equal.

by Steve Ditlea

OK, pick up your pencils and circle the misspelled words in the following list: embarrass, accommodate, supersede, precede, susceptible, Mediterranean, recommend, omission, minuscule, and perceive.

Now for the bad news: All the words above are spelled correctly. That list of 10 commonly misspelled words should tell you something: The English language isn't easy. And all the mnemonic sayings in the world won't help when you need to know the definitive spelling of a word before you submit a

proposal to the boss; nothing detracts from a business letter as does a misspelling.

That fact accounts for the proliferation of spelling checkers. Within just a few years, personal computer spelling checkers have gone from exotic add-on programs to standard features in word processing packages. The latest wave of word processor upgrades confirms this: Such former holdouts as Volkswriter and PC-Write have recently added spelling correction. (Only XyWrite

Steve Ditlea has written about and used word processing programs since 1980.

III remains spelling checker-less among major word processors.) With hard disks now on more than half of all MS-DOS computers, large amounts of available storage will accelerate the trend toward the use of spelling checkers.

The popularity of these electronic proofers has developed so quickly that few users have had the chance to become familiar with different programs, whether built into word processors or as stand-alone programs. Then again, the publishers of a \$495 word processing package may not be keen on your finding out that the word list for their spelling checker was originally culled from such romance novels as "Destiny's Mistress" and "Teach Me To Love," or that one widely used word base for U.S. English was actually compiled in Belgium. Even when the source of a disk-based dictionary is a standard reference work like *Webster's Ninth New College Dictionary*, and many word processors use the same spelling checker, the actual implementation can vary widely.

Not that differences among spelling checkers may matter if you're already experiencing the productivity increases and quality control benefits of computerized dictionary software. "Spelling checkers are a necessity in my business," says Garattan Gray, president and general manager of the *Monroe* (Michigan) *Evening News* (published six times per week, with a circulation of 27,000). Newspaper recruits have changed since the days of "The Front Page": "Reporters have become far worse spellers over the years," says Gray. "Everyone we hire has to take a copy editing test: It used to be that a score of 85 was passing; no one in the last 10 years has gotten over 70."

Gray compensates for this with Borland International's Turbo Lightning on the eight Zenith 148 (IBM PC-compatible) dual-floppy desktop systems serving the editorial staff. That package includes an electronic version of the *Random House Dictionary* and *Random House Thesaurus*, along with Desk Plus desk management software and a customized word processing package. Gray recalls: "After a few weeks, my city editor told me that he was saving a half hour a day by not having to correct copy. The reporters' spelling continues to improve from seeing the corrections on their screens."

Turbo Lightning was the first to offer spelling correction while you typed—beeping when you misspelled a word—

but most reporters have turned off this feature, preferring to check their documents a screen at a time. For his own writing, which consists mostly of correspondence and departmental memos, Gray uses a word processing program built around another real-time spelling checker, Airus, Inc.'s, Write Now. Not that he wouldn't catch misspellings himself ("I'm a better speller than any secretary I've ever had"), but he likes the insurance factor of having his work double-checked by the computer.

It's hard to imagine that before this decade, the notion of a computer checking everyday writing for spelling errors was largely science fiction. A few main-frame and minicomputer utilities could check program code for misspellings, and dedicated word processors were beginning to offer spelling checkers, but at a minimum of \$7,500 for such a system, only larger organizations could afford them. Later, in 1980, along came Spellguard, the first personal computer program to offer an electronic spelling dictionary—for users of the CP/M operating system then prevalent.

"People laughed when I predicted that soon no word processor would be sold without a spelling checker," recalls Dennis Coleman, author of Spellguard, which later became the first spelling checker for MS-DOS computers. He started writing Spellguard after several readings of a report by his associates failed to pick up what turned out to be embarrassing misspellings.

Coleman compiled a 20,000-word dictionary file against which his Spellguard checked spellings. Unfortunately, the word "misspelling" was one of the many incorrectly spelled words in it. But Coleman's product demonstrated that by using compression techniques to reduce the space taken up by word lists, you could store a useful dictionary on the limited-capacity media of early-day personal computers.

Any spelling checker is only as good as the contents of the dictionary on which it's based. Though used in word processing, spelling checkers are actually specialized data management applications, with a disk-based dictionary serving as the data base and a detect-and-compare program, called an "engine," that powers the search. The program compares the words within a document or on a text screen to the contents of the dictionary file; it considers any mismatches misspellings and flags them on your personal computer display.

Selected Spelling

PRODUCT/Company

MS-DOS Word Processors

DisplayWrite 3 IBM; 100 Summit Ave., Montvale, NJ 07640; (201) 358-5689 (Circle 380)

MultiMate Advantage 3.06 Ashton-Tate; 20101 Hamilton Ave., Torrance, CA 90502; (213) 329-8000 (Circle 387)

Office Writer 5.0 Office Solutions, Inc.; 2802 Coho St., Madison, WI 53713; (608) 274-5047 (Circle 388)

PC-Write 2.71 Quicksoft; 219 First N #224, Seattle, WA 98109; (206) 282-0452 (Circle 389)

PFS: Professional Write Software Publishing Corp.; 1901 Landings Dr., PO Box 7210, Mountain View, CA 94039; (415) 962-8910 (Circle 390)

Word 3.1 Microsoft Corp.; 16011 NE 36th Way, Box 97017, Redmond, WA 98073; (206) 882-8080 (Circle 396)

WordPerfect 4.2 WordPerfect Corp.; 288 West Center St., Orem, UT 84057; (801) 227-4020 (Circle 398)

WordStar Professional 4.0 Micropro Intl. Corp.; 33 San Pablo Ave., San Rafael, CA 94903; (415) 499-1200 (Circle 399)

Write Now 1.4 Airus, Inc.; 10200 S West Nimbus Ave., Suite G-5, Portland, OR 97223; (503) 620-7000 (Circle 400)

MS-DOS Stand-alone Programs

The Reference Set 2.04 Reference Software; 330 Townsend St., San Francisco, CA 94107; (415) 541-0222 (Circle 413)

Turbo Lightning 1.02 Borland Intl.; 4585 Scotts Valley Dr., Scotts Valley, CA 95066; (408) 438-8400 (Circle 414)

Webster's NewWorld Spelling Checker 1.04 Simon & Schuster Computer Software; 1 Gulf & Western Plaza, New York, NY 10023; (212) 373-8133 (Circle 409)

Mac Word Processor

Word 3.0 Microsoft Corp.; 16011 NE 36th Way, Box 97017, Redmond, WA 98073; (206) 882-8080 (Circle 409)

Mac Stand-alone Programs

MacGas 2.0 Enterset; 410 Townsend St., San Francisco, CA 94107; (415) 543-7644 (Circle 381)

MacLightning 2.0 Target Software; 14206 SW 136 St., Miami, FL 33186; (305) 252-0892 (Circle 382)

MacProof 2.0 ALP Systems; 190W 800N, Provo, UT 84604; (801) 375-0090 (Circle 404)

MacSpell+ 1.67 Creighton Development, Inc.; 16 Hughes St., Suite C-106, Irvine, CA 92718; (714) 472-0488 (Circle 405)

Spellswell 1.3 Greene, Johnson, Inc.; 321 Alvarado St., Suite H, Monterey, CA 93940; (408) 375-2828 (Circle 407)

Thunder 1.1 Batteries Included; 30 Mural St., Richmond Hill, Ontario, Canada L4B 1B5; (416) 881-9941 (Circle 408)

Checkers Compared

DICTIONARY SOURCE	WORD SIZE OF DICTIONARY	WORDS IN USER DICTIONARY	MEMORY REQUIREMENT	ALGORITHM	SUGGESTS CORRECTIONS	DICTIONARY MODE	PRICE	NOTES
Proprietary	125,000	500 per dict. Unlimited dict.	310k-314k	Phonetic	Y	Batch/ interactive	\$495	
Webster's Ninth New Collegiate Dictionary	110,000	Unlimited	320k	Pattern match	Y	Batch/ interactive	\$595	Includes 30,000 legal and medical terms.
Webster's Ninth New Collegiate Dictionary	80,000	Unlimited	256k	Phonetic/ pattern match	Y	Batch/ interactive	\$495	Free legal and medical dictionaries on request.
Proprietary	50,000	5,000-6,000	320k	Phonetic	Y	Batch/ interactive	\$89	
Proprietary	77,000	5,000 per dict; Unlimited dict	320k	Pattern match	Y	Batch/ interactive	\$199	
Proprietary	80,000	5,000-7,000 per dict. Unlimited dict.	256k	Pattern match	Y	Batch/ interactive	\$450	
Proprietary	115,000+	Unlimited	256k	Phonetic/ pattern match	Y	Batch	\$495	
American Heritage	87,000	1,500 per dict. Unlimited dict.	256k	Phonetic	Y	Batch/ interactive	\$495	
Proprietary	35,000	Unlimited	384k	Pattern match	Y	Batch/ interactive	\$150	
Random House	133,000	Unlimited	128k	Pattern match	Y	Batch/ interactive	\$89	Includes a thesaurus.
Random House	83,000	Unlimited	128k	Phonetic	Y	Batch/ interactive	\$99.95	Includes a thesaurus.
Webster's NewWorld Dictionary, 2nd Ed.	114,000	Unlimited	256k	Phonetic/ pattern match	Y	Batch	\$150	
Proprietary	80,000	Unlimited	512k	Phonetic/ pattern match	Y	Batch/ interactive	\$395	
Proprietary	80,000	Unlimited	512k	Pattern match	Y	Batch/ interactive	\$99	Includes a thesaurus.
Webster's Ninth Ed.	80,000	Unlimited	512k	Phonetic/ pattern match	Y	Batch/ interactive	\$99.95	
Webster's	93,000	5,000 per dict. Unlimited dict.	1Mb	Verifier only	N	Batch	\$195	Checks style, punctuation, capitals.
Proprietary	75,000	Unlimited	512k	Pattern match	Y	Batch/ interactive	\$99	Includes a thesaurus.
Proprietary	153,000	Unlimited	512k	Verifier only	N	Batch	\$74.95	Includes a homonyms dictionary.
Proprietary	50,000	Unlimited	512k	Pattern match	Y	Batch/ interactive	\$49.95	

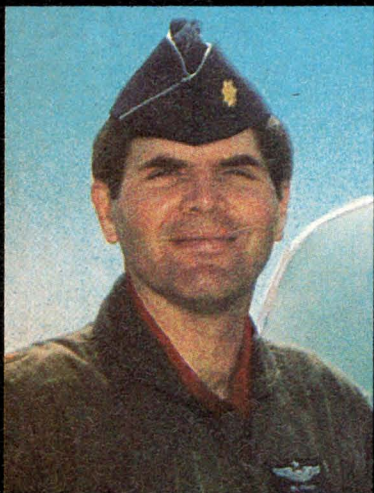
F-15 STRIKE EAGLE

For Fighter Pilots—*Not* Sightseers

Enjoyed by
over **200,000**
satisfied computer
fighter pilots!



THE FIRST. THE BEST. THE **ONLY REAL** COMBAT FLIGHT SIMULATOR.



MAJOR BILL
OVER
3000 FLYING HOURS

F-15 STRIKE EAGLE is the most realistic, accurate and fun combat flying simulation available. Others have tried to copy it. But none of them have ever strapped on a fighter to experience the thrill and excitement of real combat fighter missions like our Major Bill* has. Compare F-15 STRIKE EAGLE versus our famous competitors, better known for their fancy hangar graphics. If you want a **slow sightseeing hangar queen, buy theirs!** If you want a product that has had over 50 outstanding reviews, thrilled over two hundred thousand satisfied computer fighter pilots, and gives you **real** fighter pilot action, then you want F-15 STRIKE EAGLE!

COMPARE —

COMPARE	F-15 STRIKE EAGLE	IMITATION GAME
SPEED	4 TIMES FASTER	SLOW AND UNRESPONSIVE**
COMBAT AREA	7 REAL MISSIONS—LIBYA TO THE PERSIAN GULF	2 SMALL FICTITIOUS FLYING AREAS
COCKPIT	SOPHISTICATED NAVIGATION MAP. MULTIPLE RADAR AND WEAPONS DISPLAY	TWO LINES OF TEXT
ACTION	MULTIPLE MISSION OBJECTIVES AND THREATS	PICK ONE MISSION OR ONE SET OF THREATS
VALUE	GREAT VALUE—(HUNDREDS OF HOURS OF PLAYTIME)	OVERPRICED

**C-64 COMPARISON

F-15 STRIKE EAGLE is for Commodore 64/128, Atari 800/XE/XL series, Apple II+ family, IBM PC and PC JR computers for a suggested retail price of only \$34.95. Call or write for more information or Money Order, MC/Visa orders. Add \$2.50 for shipping and handling.

Registered trademarks of Commodore Business Machines, Inc., Atari, Inc., Apple Computer Inc., and International Business Machines, Inc., respectively.

Major Bill Stealey, USAF Reserve, President, MicroProse

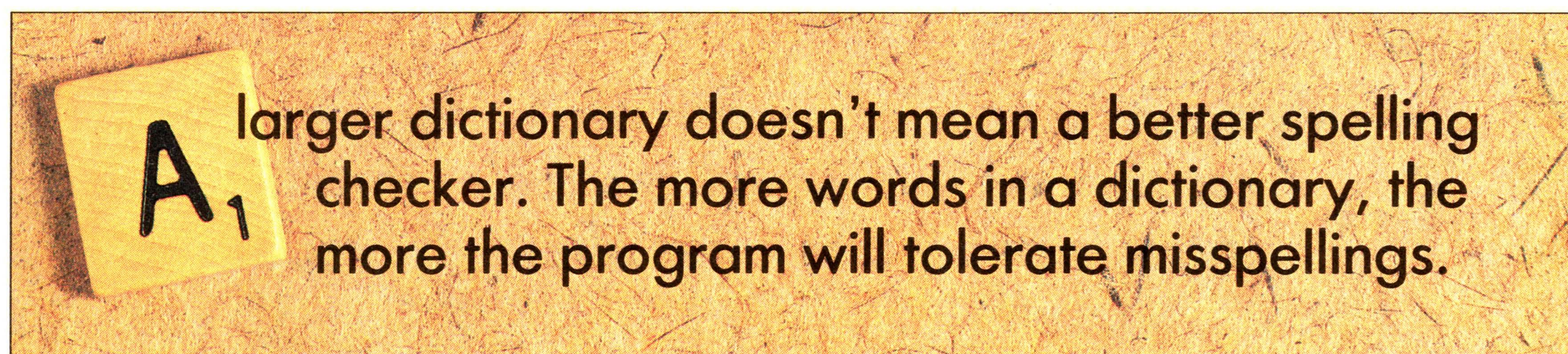
MICRO PROSE

SIMULATION • SOFTWARE

120 Lakefront Drive • Hunt Valley, MD 21030

(301) 667-1151

(For More Information Circle 51)



One critical element to the utility of dictionaries is their base lists; word lists should fit the usage and style of the document to which you will apply them. Coleman's original spelling checker emphasized business terms, since it grew out of his work as a consultant for the government.

Another early spelling checker, *The Word*, also preserves its origins in its dictionary. Software pioneer Wayne Holder's wife wrote romance novels on an early IMSAI computer. Holder's experiments in compressing her manuscript files for easier storage resulted in a dictionary of 40,000 words, augmented with useful terms from beyond the valley of the bodice shredders. Now up to 60,000 words and counting, *The Word Plus* is the spelling checker in Symantec's Q&A, Bank Street Writer Plus, and Microsoft Word (MS-DOS only; the Mac version uses a different spelling checker—see below).

Until *The Word Plus*, all spelling checkers were *verifiers*, flagging words not found in their dictionary lists. This program was the first *corrector*—one offering alternative words with correct spellings. Now all of the checkers offer alternate spellings and most display misspelled words in context. *The Word Plus* also established the now-standard options of accepting a suggested spelling, typing in another spelling, adding the flagged word to a user dictionary, or ignoring it and going on to the next misspelling.

The Word Plus, still available in a stand-alone package from Software Heaven, Inc., in San Diego, was put through its paces as the Spell program in Microsoft Word version 3.1. The spelling checker, which you can use while editing a document (called interactive mode) or after you finish writing a document (batch mode), was tested on a letter filled with traps for various weaknesses in spelling checker programs (see sample letter). In batch mode (invoked by typing in SPELL at the DOS prompt), the program took 40 seconds

to check the letter and indicated 21 unknown words out of a total of 181 words. It offered correct spellings for "colaborate" and "overacheiver," but gave "ht" as a correction for "the" misspelled as "hte" and failed to suggest spellings for "autobiografy" as well as "skizofrenik."

Word 3.0 for the Macintosh (in a prerelease version we worked with) uses Soft-Arts' 80,000-word Multilingual Spelling Verification/Correction Program dictionary as its base. Soft-Art is a multinational company founded in Belgium—hence its American English dictionary compiled far from U.S. shores at the University of Louvain outside Brussels. This hasn't prevented Soft-Art's speller from making inroads in the U.S.; it is also packaged with PFS:Professional Write, Samna Word IV, and Volkswriter 3.

You can create as many user dictionaries with the program as you like, limited only by your disk space. You activate the checker with a pull-down menu or by hitting Command-L. Word for the Mac checks an entire document, a selection (a sentence, a paragraph, or a number of paragraphs), or a single word.

Word flagged 22 errors in our test document and suggested 14 correct spellings and four incorrect spellings. It failed to cite 16 other errors including the lowercase "i." In addition, Word missed the repeated word "over," but was among the only programs tested to suggest the correct spelling for "skizofrenik." Word also scored a hit on the correct spelling of "niether," and offered "knitwear" as its second alternative.

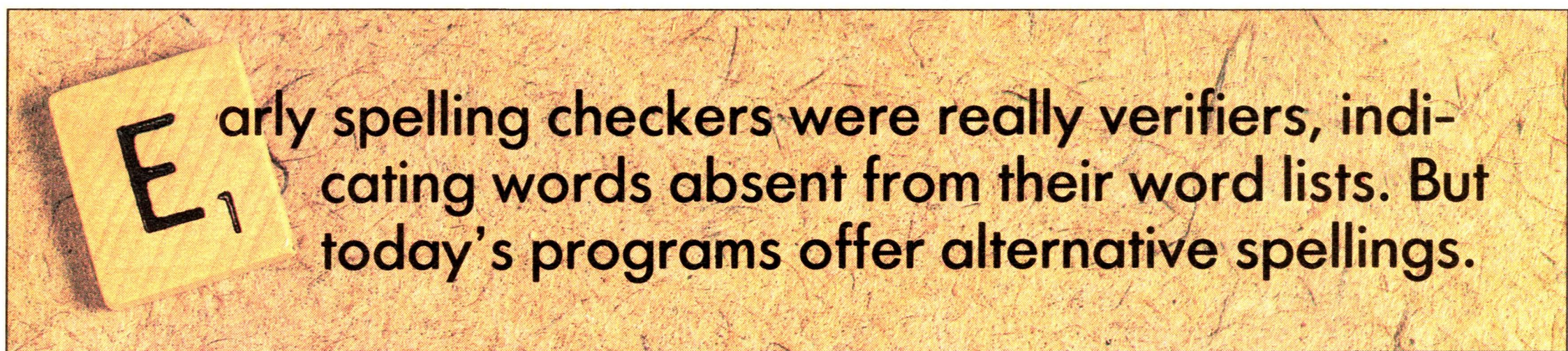
"A spelling corrector is a true artificial intelligence application," explains Henry Kucera, professor of linguistic and cognitive sciences at Brown University. "It must simulate human behavior, taking into account phonetic misspellings and anticipating human errors." By adding linguistic rules to a spelling corrector he designed, Kucera boosted the accuracy of suggested spellings to over 80 percent on the first try. His work earned a patent for The Houghton Mifflin Spelling Corrector, now li-

censed to over 30 office automation manufacturers and best known as CorrectStar, the spelling corrector in MicroPro International's WordStar, WordStar 2000, and Easy.

CorrectStar includes an 87,000-word dictionary based on the *The American Heritage Dictionary* (published in hard cover by Houghton Mifflin). The current word list is up from 67,000 in previous versions of the spelling checker, but don't look for word counts to keep escalating. Recent independent research shows that a dictionary beyond the 60,000-80,000-word range may be self-defeating. The reason is that as you add words, the number of permissible words and their permutations increases, and you'll therefore see fewer misspellings noted. "A bigger dictionary doesn't necessarily mean a better one," Kucera comments. "Often it can be less accurate in finding misspellings. For instance, if you have obscure words like 'calender' and 'embar' [in a dictionary program], you could miss incorrect spellings of 'calendar' and 'ember.'"

Houghton Mifflin optimized the words in the CorrectStar dictionary according to Kucera's studies of word usage. In 1967, he published the first computer-generated list of frequently used U.S. English words, a reference work known as *The Brown Corpus*. Among his findings: "the" is the most written word, accounting for 7 percent of all usage; "of" and "to" come in at number two (with "of" more common in technical writing) and the most frequently misspelled word is "from." No spelling corrector will flag its usual misspelling, "form," because it's a valid word—and that includes Kucera's program, run in WordStar Professional release 4.

Unlike previous versions of WordStar, which invoked CorrectStar from the opening menu, MicroPro's newest release checks spelling during editing. Separate commands let you check an entire document, the word at the cursor, or a word typed in. CorrectStar was the most selective of the spelling checkers



we found, flagging 30 misspellings with the test letter, including "self-taut" and "puting" (not spotted by The Word), though it mistakenly designated as misspellings "remap," "peace-of-mind," "start-up," "John" (suggesting "Join"), and "Joan" (suggesting "John"). It did offer correct spellings for "autobiography" as well as "skizofrenik," and provided appropriate alternatives for "hte" ("the") and "worts" ("words"). One blind spot was its inability to suggest the correct spelling for "synonym."

As with other applications, improving a spelling checker involves juggling limitations in hardware and software. "There's always a tradeoff between speed and size," says Peter Yanilos, president of Proximity Technology, Inc., publisher of one of the most used spelling checkers, licensed to over 60 manufacturers and included in Framework II, Symphony, Manuscript, MultiMate Advantage, and Office Writer 5.0. Because of design tradeoffs in allocating internal memory and disk space, the speed of the Proximity Linguistic System in various word processors can differ by a factor of two to three, according to Yanilos. Also peculiar to each package is how the same spelling corrector operates; for instance, Framework II can check spellings in spreadsheets and data base files while rival Symphony can check spelling only within word processing documents.

Proximity lays claim to having one of the most effective compression systems, squeezing over 80,000 words from *Webster's Ninth New Collegiate Dictionary* (published by Merriam-Webster) into about 220k of disk space (roughly three-fourths the space CorrectStar's similarly sized word list requires). It also compresses user-created dictionaries of specialized words not found in the main dictionary—allowing individual files of 10,000 words apiece (as opposed to CorrectStar's 1,500 words each). The same compression technology is about to make possible a full computerized definition dictionary in 1Mbyte of storage for hard disk systems—also from Proximity.

Denser dictionaries alone can't guar-

antee a more accurate spelling checker, however. The programs need improved rules, or algorithms, to recognize correctly spelled words even if they don't match what appears in the dictionary. "It's important to strike a balance," says Yanilos. "No rule-based system is perfect." Proximity's detection algorithms analyze capitalization, contractions, hyphenated compounds, prefixes and suffixes, and the use of the same word twice in a row.

Proximity's performance varies in tests of the interactive spelling checkers in MultiMate Advantage and Office Writer 5.0. In our letter, MultiMate spotted 23 misspelled words (flashing their first letters on-screen all at once), while Office Writer found 28 errors (highlighted one at a time as you scroll through the file) including "puting" and "self-taut"—unnoticed by the former program. Office Writer picked up the repetitious word "over," even though MultiMate did not. One explanation for the disparity: MultiMate Advantage 3.06 added an extra 30,000 legal and medical terms to its word list, making it more tolerant of misspellings.

The Proximity spelling checker is designed to work with dictionaries in seven languages, though detection and correction algorithms differ from language to language. Even more versatile is Soft-Art's spelling program, with dictionaries in 11 languages.

It's difficult to get an accurate count of Soft-Art's word list since it comprises root forms meant to be matched to words stripped of their suffixes. In this way, Soft-Art can verify over 130,000 different words using 60,000 root words (though it may also accept as correct words that don't exist at all). User dictionaries are usually limited in size only by disk space. In addition, word processor publishers have added their own words; for example, Volkswriter claims a list of 170,000 words, making its spelling checker what's called "the most complete available."

As we've seen, when it comes to dic-

tionaries, bigger isn't necessarily better, so the Soft-Art spelling checker was put to the test in PFS: Professional Write, with its more typical 77,000-word dictionary. The results were commendable: finding 25 misspellings in the sample letter, this interactive spelling checker (easily invoked from the menu at the top of the screen with F5 for "dictionary," followed by the choice for "proof document") was one of the few to spot "fo" (though it suggested "foe" instead of "of" as the correct spelling), signal the repeated word "over," and offer "York" as the correct form for the misspelled "Yrok."

Compiling a spelling list at an academic institution, as Soft-Art did, may have its advantages. WordPerfect Corp. also created its 115,000 word WordPerfect spelling dictionary this way, at Brigham Young University, near the company's Utah headquarters. Like Soft-Art's, WordPerfect's spelling corrector (awkwardly invoked with Ctrl-F2, followed by menu choices for checking a word or a document) made a minimum of erroneous calls, finding 22 misspellings (highlighted in turn) in the test letter and easily catching and suggesting correct alternatives to such potential traps as "Yrok," "fo," and "hte." One unique feature of WordPerfect's spelling checker is its algorithm that suggests word corrections—it pattern-matches characters (matching and rejuggling the letters in a word) or, if you find the words presented unsuitable, you can press a key to bring up alternative spellings based on phonetic approximations of the word. This spelling checker showed an odd characteristic: It gave the same suggested spelling twice for such words as "collaborate," "misspelling," and "overachiever." On the other hand, it did spot the duplicate use of "over" and it was only one of four spelling checkers tested that offered the correct spelling for "Volkswagon."

Another successful word processing package, PC-Write, went the academic route for its spelling dictionary, using a 50,000-word list from lexicographer Bruce Womblor, a professor at the University of New Mexico. Again, as in

WordPerfect, PC-Write's spelling engine was authored in-house. There the similarity ends: After all, this program is sold as shareware, with version 2.7's two disks available for \$16 and a fully documented copy for \$89 (instead of WordPerfect's \$495).

Unfortunately, the performance of PC-Write's correction algorithms leaves much to be desired. While it did work up to par in flagging (in inverse video) 21 misspellings in the test letter, its suggested corrections were unsatisfactory: "colander" for "colaborate," "putrefy" for "puting," and "sympathetic" for "symonym." (According to author and publisher Bob Wallace, PC-Write version 2.71 will include phonetic algorithms for better matches.) Aside from this, PC-Write's spelling checker is well designed, automatically loading its 110k dictionary into memory when first invoked (with Alt-F5 from the editing screen) to save on time-consuming disk accesses. It can also check a word as you type it in, beeping to indicate its absence from your word list.

The first word processor to offer real-time checking of spelling as you typed was AI Typist from Airus, Inc., now upgraded as Write Now. Jay Eisenhower of Airus admits that 95 percent of users turn off the annoying beep in real-time checking, but claims that the same Airus technology is useful in "clairvoyance," the program's ability to complete words automatically after you type in a few characters, and "spell guard," a feature that you can toggle to keep misspelled words from appearing on-screen during typing. Airus claims that Write Now's spelling list of 35,000 words was compiled with the business professional in mind.

How good is its spelling checker? Not very. In interactive mode, Write Now highlighted (in glaring fuchsia) a whopping 38 misspellings in the test letter, including such correct words as "thesaurus" and "savvy." Its algorithms are obviously limited to alphabetically matching words, with no recognition of transpositions or phonetic mistakes. Its suggestions (which pop up in a window at the push of Ctrl-Enter) are in strict alphabetical order so that the first suggestion for "overacheiver" was "overall" and the first alternative to "symonym" was "sydney," followed by over 50 more possibilities that scrolled alphabetically until the correct spelling appeared.

IBM, instead of trying to score innovative "firsts" with its personal comput-

er software, is known for using proven technology. The spelling checker capability in DisplayWrite and Writing Assistant packages is no exception. Based on the Word Proof stand-alone spelling checker originally released in 1983, this module in both word processing packages features a 125,000-word dictionary culled by an IBM development team in Maryland. The actual implementation differs slightly: In Writing Assistant, a user dictionary is limited to 8,000 characters, while in DisplayWrite, you can develop an unlimited number of personal dictionaries of 4,500 characters each. In addition, DisplayWrite users can order lists of legal jargon (16,000 words) and medical terms (79,000 words) from IBM.

The DisplayWrite 3 user can invoke IBM's spelling checker from within the text area simply by pressing F9, or from the program's bar menu by selecting the Spell option followed by Check Document. (Other choices are for checking a word or page.) You can use the spelling

feature in interactive mode by selecting the "prompted" option, while "automatic" mode highlights an entire document batch-style for subsequent revision. Another handy feature: special characters you can insert into text to omit words like foreign expressions or technical terms from a spelling check.

When checked with our test letter, DisplayWrite 3 indicated 27 unknown words. It gave correct spellings for 10 of them. It had particular trouble with hyphenated words: it flagged "start-up" and offered "stratum" as the first alternative, and noted the correctly spelled "peace-of-mind" and "one-hundred-per-cent," but gave no alternatives. It did, however, catch "self-taut" and provide the correct spelling.

DisplayWrite also caught "fo," but offered "Fe" and "FL" as alternatives. It also flagged "hte," but gave "hate" as

Words That Fail You

Our sample letter contains 19 misspellings, obscure words ("fro" and "worts"), proper nouns, and words misspelled in context.

Joan K. Doe
2 Lincoln Plaza
New Yrok, NY 10023

John Q. Famous
1311 Blueview Terrace
Bonney Lake, WA 98390

Marck 12, 1987

Deer Ms. Doe:

As I look out form my house, I can't wait to colaborate on our new start-up. Puting together my autobiografy fro publication will give me peace-of-mind. To a guy from the wrong side fo hte tracks by Stanford, this book makes me feel like a overacheiver all over over again.

Because I am self-taut, you sea I talc beter then I right. That's why I depend on a spelling checker too spot my misstakes and misspellings. I Also like to use an electronic thesaurus fro finding beter worts. But do i rilly need a symonym for Volkswagon? Are enough business terms in the dictionaries? How about sport(s) terms? Will I find "stadium" or "aria" or "schmaltz"?

Of course, nun of these programs is one-hundred-per-cent perfect. Than again niether am I. That's why I need your public relations savvy to remap my skizofrenik story and take the world by storm. Go fro it!

Cincerlly,

The Product Market

Physical Attributes of Market

- Size of market
- Geographic location
- Demographic description of purchasers

Behavioral Characteristics of Purchasers

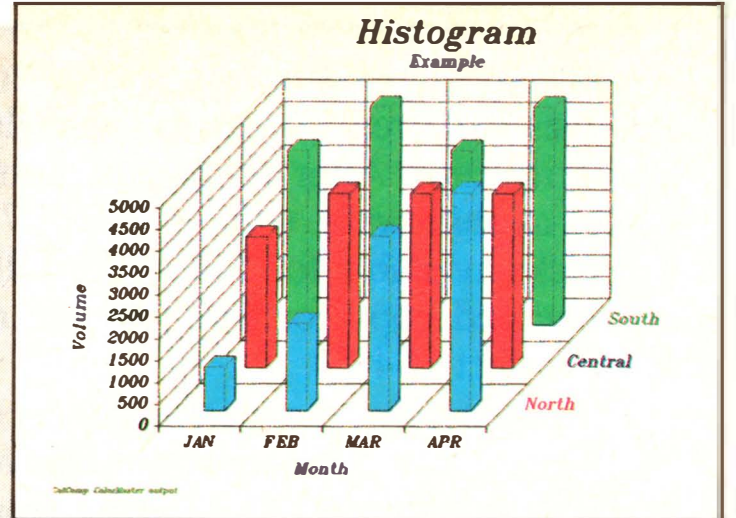
- When purchases are made
- How buying is done
- Purchasing influences

Sign-Master by Decision Resources

MARKET GROWTH

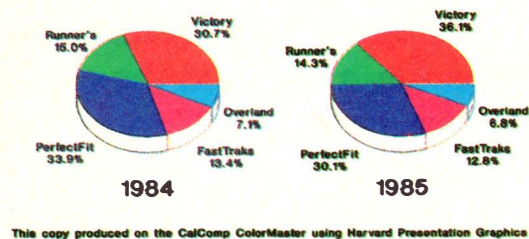
FISCAL	INDUSTRY RETAIL SALES (UNITS)	INCREASE VERSUS PREVIOUS YEAR
1982-83	8,523	16.3%
1983-84	9,980	17.1%
1984-85	11,870	18.9%
1986-87	14,244	20.0%
1987-88	18,193	27.7%

Diagram-Master by Decision Resources

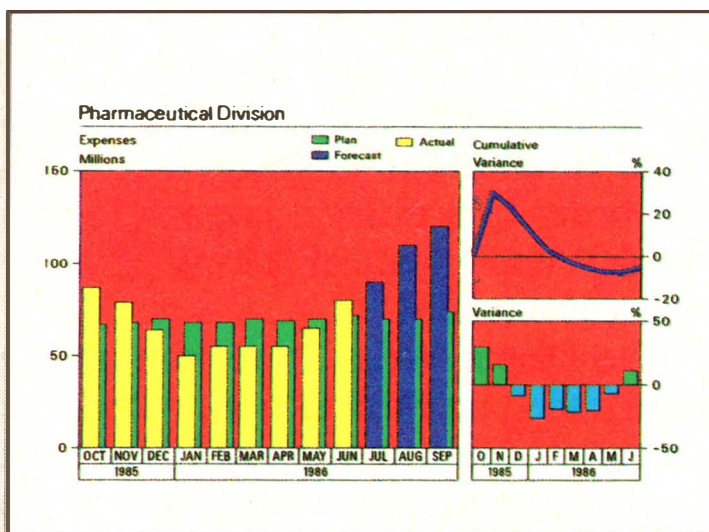


The Smart Series by Innovative Software

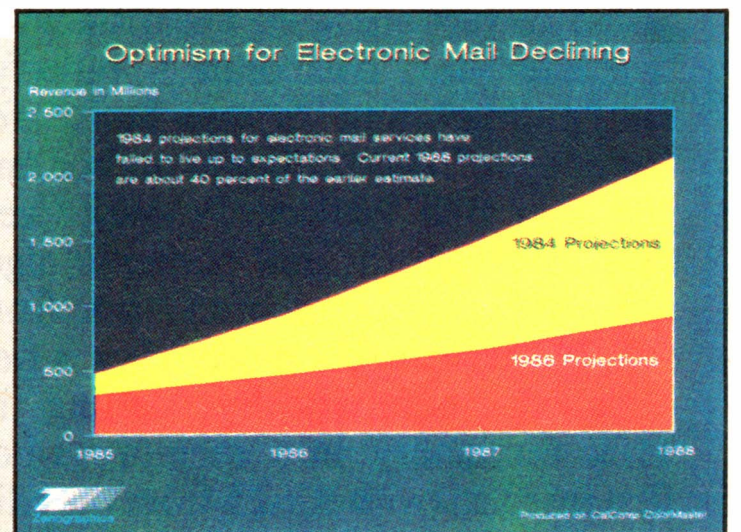
ABC Corporation Captures Market Share!



*Harvard Presentation Graphics
by Software Publishing*



LINK-A-GRAPH by ISSCO



Mirage by Zenographics

PUT COLOR IN YOUR HANDS, FAST.

ColorMaster® plotter/printer and your PC. That's all it takes to put living color into your presentation. Reports, memos, renderings, even transparencies projected on the screen. All in fantastic full-color. Fast.

You can get a whole page of highly color-saturated graphics printed out in a minute. Or only 20 seconds for a page of printed black and white text.

ColorMaster's speed comes from advanced thermal transfer printing technology. So, quickly and quietly, the ColorMaster plotter/printer can produce high resolution color graphics up to 20 times faster than a pen plotter.

ColorMaster is ready to run with most popular graphics packages you might already be using, like Lotus® 1-2-3®,

Chart-Master™, Dr. Halo™ and more.*

It also has a fully-buffered PC interface which lets you go on working while ColorMaster is printing. What's more, multiple copies can be made without retransmitting data.

Software compatibility. Richly colored graphics. High-speed text. Along with worldwide support, service, and 25 years experience in computer graphics.

With CalComp, you get it all.

Call us at
1-800-CALCOMP,
or write CalComp,
P.O. Box 3250,
Anaheim, CA
92803.



CALCOMP

*Some of these software packages include: The Master Series™ from Decision Resources; Packages compatible with General Parametrics Video Show;™ IBM® Professional Graphics;™ ISSCO™ PC LINK-A-GRAPH;™ Smart Series™ from Innovative Software;™ Lotus® 1-2-3;™ Symphony;™ Dr. Halo™ from Media Cybernetics; Micro SPSS™ from SPSS Inc; Harvard™ Presentation Graphics from Software Publishing;™ Mirage;™ Autumn;™ Ego™ from Zenographics. © 1986 CALCOMP.

(For More Information Circle 68)



Some spelling checkers have ignominious origins: Consider those culled from newspaper articles or "Destiny's Mistress," a romance novel.

the first alternative without citing "the." The checker cited "rilly," but failed to offer "really"; it also gave no alternative for "Volkswagon." DisplayWrite highlighted the properly spelled "schmaltz," too. It flagged "skizofrenik" but gave no alternative and suggested "Cancerously" as the first alternative to "Cincerlly," never listing "Sincerely." DisplayWrite didn't flag remap, however.

For word processing users happy with their current software who'd like to add a spelling checker, three major rivals vie for attention among stand-alone MS-DOS programs. The Simon & Schuster Webster's NewWorld Spelling Checker claims the most words in its base dictionary—more than 114,000 from *Webster's NewWorld Dictionary* (Second Concise Edition). Webster's NewWorld is also the only such program to incorporate over 15,000 common misspellings from a misspeller's dictionary. The same batch mode spelling checker is also part of Webster's NewWorld Writer word processor. Among its handy features: a preview mode that lists all incorrectly spelled words for quick editing or addition to an auxiliary dictionary (with room for about 3,000 words) and a choice of four different levels of scanning for alternative spellings. (You can adjust the comprehensiveness of dictionary searches from 400 to 3,000 words, depending on how fast you want the program to operate.)

Webster's NewWorld Spelling Checker (compatible with ASCII files and 11 top word processors) has one of the best organized displays, with separate windows for text, prompts, commands, and alternate spellings. It highlighted in yellow 21 questionable words in our test letter, picking up such traps as "puting" and "fo," though its first suggestions of "punting" and "foe" were not too helpful. The fact that it offered as the correct form of "colaborate," not just "collaborate," but also "collaborated," "collaborates" and "collaborator"

attests to Webster's storing all plurals and derived words in its dictionary instead of relying on algorithms to generate these from root words. Thus it has fewer different words than billed, but is also more accurate than most spelling checkers. It could use improved phonetic checking, though, because it failed to find a correct spelling for "skizofrenik" and offered such off-the-mark suggestions for "Cincerlly" as "Cancel," "Cancer," and "Sincerity," but not "Sincerely."

The other top add-on spelling checkers, offered in The Random House Reference Set and Borland's Turbo Lightning, use identical dictionaries, culled from the *Random House Dictionary* (Concise Edition). These are provided in 50,000- and 80,000-word files, to be used depending on internal memory, and floppy, hard, or RAM disk installations. Just how differently the same dictionary performs with competing engines was demonstrated by a direct face-off of the two programs.

You can use Reference Software, Inc.'s, Reference Set as an interactive spelling checker from within any of a dozen major word processors or as a batch checker by using the supplementary program Refspell. In batch mode, it was surprisingly slow with the brief test letter, taking over a minute and a half to flag 27 doubtful words, including such acceptable hyphenated words as "one-hundred-per-cent" as well as "peace-of-mind." It was also a truly sexist spelling checker, one of only two tested here to take exception to "Ms." On the other hand, when loaded as a memory-resident spelling checker, Reference Set was among the fastest, with a 1,200-word subset dictionary stored in memory usually responsible for recognizing 82 percent of the words used in the text.

With its biggest dictionary, the Reference Set's speller was far from the mark in suggesting correct spellings: for "hte" it gave "how-to" and "howdah," while for "colaborate" it offered "cola" and "colander" before coming up with "collaborate" and eight other forms of the word. If this corrector weren't so inade-

quate, some suggestions would even be comical; for "overacheiver," it displayed 25 incorrect alternatives beginning with "ovaries" and "overabundance." Still, it was one of the spelling checkers to offer the correct spelling of "Volkswagon," as did Turbo Lightning.

Starting with the same Random House dictionary licensed from Wang, the owners of the electronic rights, Borland International wrote an engine for Turbo Lightning with more sophisticated pattern-matching and phonetic algorithms than Reference Set. Among the improvements in the latest revision, version 1.02, is an algorithm for recognizing possessives. But the engine's real-time mode, beeping or flashing as you type an incorrect word, and interactive use limited to checking no more than a screen at a time, can drive you to distraction at times. It also takes some getting used to when WordStar version 4.0's function key prompts at the bottom of the screen are flagged by Turbo Lightning's proofer for such misspellings as "Underlin" and "Del Word."

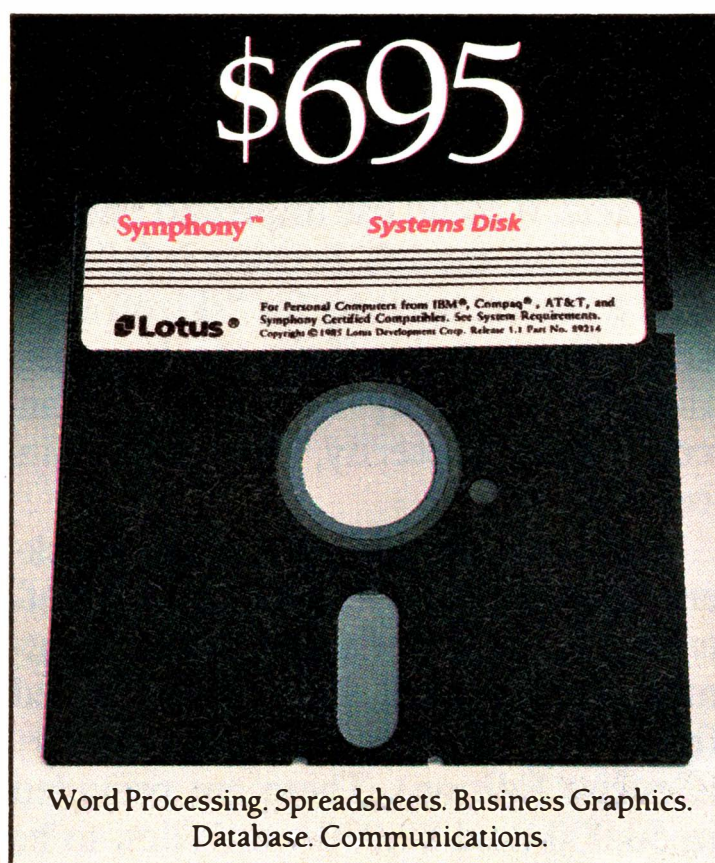
You call up Turbo Lightning as a memory-resident program when configured with any of a dozen best-selling word processors. You bring its bar menu to the screen by pressing Shift-F8, and spelling suggestions pop up in a window if you press Alt-F9. When checking for a correct spelling, Turbo Lightning starts with an in-memory file of 6,000 words. If a word is not found there, the program will search through its disk-based dictionary for an alternative. When tested, it picked up 22 misspellings and provided alternatives with impressive speed. Turbo Lightning almost instantaneously displayed "March," "York," and "of" as correct spellings and typically took a three-second disk access to provide "collaborate" or "putting." Then again, it too had problems deciphering "Cincerlly," giving such alternatives as "Cinderella," "Concretely," and "Cinderous," but not "Sincerely."

Mac users have a wider selection of stand-alone programs from which to

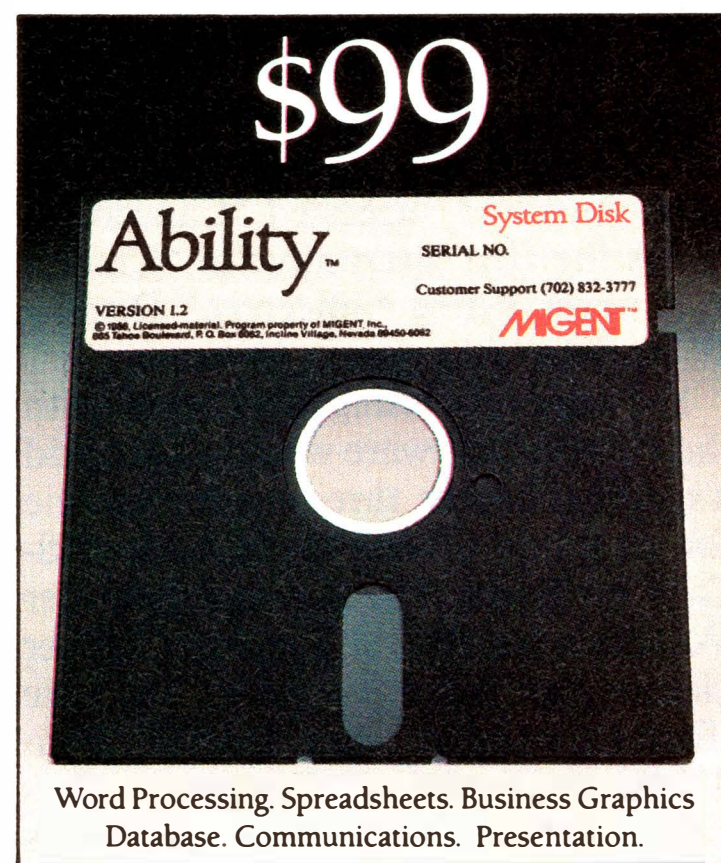
These prices are ridiculous.



Word Processing. Spreadsheets. Business Graphics.
Database. Communications.



Word Processing. Spreadsheets. Business Graphics.
Database. Communications.



Word Processing. Spreadsheets. Business Graphics.
Database. Communications. Presentation.

Compared to the other guys, Ability™ is priced so low it's ridiculous. Because now with Ability you can get the same results without learning any exotic commands or reading volumes of arid documentation. All for an unbelievable \$99.

Complete set of power tools.

Ability combines six high-powered PC productivity tools into a single, simple package.

You get full-featured wordprocessing with what-you-see-is-what-you-get formatting. Spreadsheets three times larger than Symphony, with all the powerful math and business functions you need, and the ability to import Lotus 1-2-3 files. It'll even print sideways for those oversized spreadsheets.

A forms-oriented database that's easier to use than pfs: file. Professional business graphics from your spreadsheets and databases with just a few keystrokes. Menu-driven Migent Pocket Modem™ and Hayes-compatible communications. Even "slide" shows on your PC!

Easy does it.

Ability is based on the idea that the computer should do the work. Not you. It's got smooth seamless integration like nothing you've ever seen before. Because with Ability,

everything is linked together—live. Text, spreadsheets, graphics and database.

So any changes you make are automatically made in the linked spreadsheet or database. Or change the spreadsheet and your text is updated at the same time. And your graph is automatically redrawn to reflect the changes, either way. It's perfect for those weekly and monthly reports.

And anybody can do it with no programming at all, because Ability is menu-driven and uses the same instructions in all six applications.

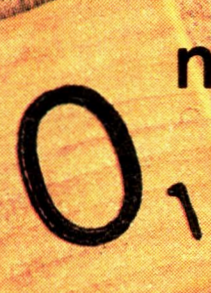
Awesome performance at a sensible price.

Compare the features and performance and you'll find that Ability truly gives you your money's worth. And at just \$99, its price isn't so ridiculous after all.

Call Migent today for your free demo disk or for the location of a dealer near you.

1-800-633-3444. MIGENT, Inc.,
P.O. Box 6062,
Incline Village,
NV 89450.

Ability™
from **MIGENT™**



One drawback to spelling checkers is that they don't check word syntax. So, valid words that, in context, are really misspelled get through.

choose. MacLightning is the only Mac spelling corrector whose dictionary is based on a mainstream, hardbound volume: *Merriam-Webster's Ninth New Collegiate Dictionary*. All the other programs use either in-house dictionaries or spell-checking engines bought from third parties.

MacLightning's dictionary loads automatically when you activate the program from the Apple menu. It also adds a separate menu to the Mac's menu bar to enable the selection of an optional thesaurus (also from Webster's).

MacLightning checks documents in either interactive mode or by specific word. Although it offers no in-context display, MacLightning analyzes a document for its total number of words, the number misspelled, the average length of a word, and the longest word in your document. Suspect words then appear in a separate window; you can alphabetize them before double-clicking on a word to call up the dictionary. Using the keyboard or MacLightning library of often-confusing icons (for example, a "walking fingers" icon for scrolling through the dictionary), you replace a word using your word processor's search-and-replace dialog box.

MacLightning offers keyboard shortcuts for mouse operation, invoking user dictionaries, and adding words to the main dictionary (which then appear in italics). Further, its phonetics engine lets it properly match words like "Cincerlly" with "Sincerely." And since MacLightning also uses pattern-matching in its algorithm, it presented some curious suggestions. For instance: "FM" for "fo"; "hue" for "hte"; "misplacement" for "mispelling"; "volcanos" for "Volkswagon"; and "one-sidedness" for "one-hundred-per-cent." In all, the program flagged 27 mistakes.

To its credit, MacLightning's dictionary loads automatically when you activate the program from the Apple menu. It also adds a separate menu to the Mac's menu bar to enable the selection

of an optional thesaurus (Webster's again).

Thunder is perhaps MacLightning's most serious competition, although the former is hampered by its use of the Clipboard to invoke corrections. The problem is especially acute when dealing with Microsoft programs, a problem that Thunder's maker claims is caused by Microsoft's inability to use Apple's guidelines for dealing with text on the Clipboard. Simply put, Thunder will not maintain a document's formatting (typesets and fonts) when it checks a Microsoft file.

Thunder's 50,000-word dictionary from Software Channels offers a user dictionary, and a learned words dictionary (which basically serves as a word expander, much like the glossary feature of Microsoft Word). To its credit, the program can work with more than word processors; it will, for instance, check spelling during a telecommunications session, in the Finder, in Page Maker, and every other program with which it was tested.

Although you can't delete words from Thunder's main dictionary, you can add up to 2,000 words to it, and you can augment root words with user-selected suffixes. When checking a document, you can use either the interactive feature or check an entire document. And you can activate each Thunder function from the keyboard.

In our test document, Thunder performed well. It flagged 29 errors and suggested 11 correct alternatives.

MacGas, another desk accessory, was perhaps the least satisfying of the Mac programs tested. Its dictionary (either a condensed 25,000-word or expanded 80,000-word file) can be located anywhere on a disk or in a folder. The program has a tendency to default to sound-alike words. It flagged 25 misspellings, but its pattern-matching algorithm merely cited words with similar letters. It's up to you to scroll through the display window in search of the correct word.

In its favor, MacGas (Glossary and Speller) was one of only two of the Mac programs we tested to catch "self-taut"

and offer "self-taught" as an alternative. Also on the plus side is the ability to set preferences to check and maintain capitalization.

It's interesting to note that the program's glossary feature was originally released by EnterSet as Quickword, a desk accessory-based word expander. Finally, MacGas proved surprisingly adept at dealing with proper names and places, such as Lincoln. Most of the other programs tested had limited capabilities here, other than enabling you to add geographical names to either the main or custom dictionaries.

MacSpell+, another desk accessory-based Mac spell checker whose operation is limited to checking MacWrite (2.2 and 4.5) and Word (1.0 and 1.05) documents, lets you add words to the main 75,000-word dictionary (350k) and generate custom dictionaries. It also provides a running word count and displays suspect words in context.

Its performance on our test document, however, was less than satisfactory. It flagged 27 errors, but only offered seven correct suggestions. The incorrect suggestions bordered on the comical. For instance, for "business" (which was properly spelled) the program suggested "bucksins," "buskins," and "buxomness." For "prefect" we got "perversity;" for "niether" we got "nitro." Finally, the program checks an entire document only; it will not proofread a selection or look up individual words. In its favor, MacSpell+'s speed of operation increases after it reads the first 100 words of a document.

Spellswell is one of two stand-alone Mac spelling correctors (MacProof is the other) tested. The program has much to recommend it in terms of hooks and amenities; however, its performance in catching the mistakes in our test letter was less than glowing.

First the hooks: a homonym checker; keyboard shortcuts; the maintenance of fonts, capitalization, and typesets; an ability to find double words; custom user dictionaries; and two dictionaries (either 60,000 or 93,000 words).

TANDY
102

PORTABLE
COMPUTER

The Tandy® 102

Try one on for size.

Don't let the size fool you. If you had a Tandy 102 portable computer on your lap you'd have your hands on a lot of power.

Fact one: The Tandy 102 comes with five built-in programs. Use it as a personal word processor, an address/phone directory, appointment calendar and auto dialer. Or write your own programs in BASIC.

Fact two: A built-in modem lets you communicate

with other computers over the phone. Keep in touch on the road. Or access national information services.

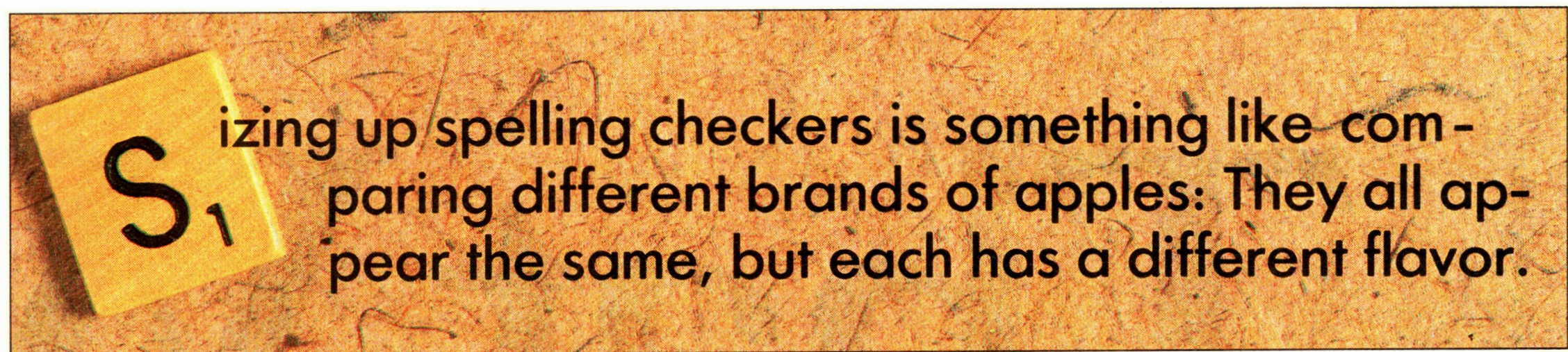
Fact three: You get all this for just \$499. The Tandy 102 packs the power of a desktop computer in a small, battery-powered package that weighs only three pounds.

Come into Radio Shack today and try on a Tandy 102 (26-3803) for yourself.

Radio Shack®
The Technology Store™
A DIVISION OF TANDY CORPORATION

Price applies at Radio Shack Computer Centers and participating stores and dealers. Actual size: 11 1/2 x 11 7/8 x 8 1/2". Batteries not included

(For More Information Circle 18)



As a stand-alone application, it's necessary to start up Spellswell and then select the document (from a word processor, Jazz, ThinkTank, More, or any text file) you want to check. In testing our document, Spellswell flagged 28 mistakes, but only suggested three usable corrections in comparison to 25 incorrect suggestions. For instance, it listed "misstate" for "mistakes"; "one-horse" for "one-hundred-per-cent"; "skiwear" for "skizofrenik"; and "overact" for "overacheiver." In its favor, Spellswell correctly suggested "self-taught" to replace "self-taut." It also flagged the double word "over" and offered a capital "I" to replace the incorrect lower-case occurrence of the letter.

Spellswell's homonym (sound-alike word) checker is another plus. It suggested 19 alternatives to the words in the letter, many superfluous, but still gives the user the option to replace or skip the suggestions.

MacProof, the second stand-alone Mac application, is the most unusual of the programs considered. It's intended for serious writers and those still learning the craft—it's an analyzer, not a corrector. Consider the following message issued while MacProof checked a document for spelling errors: "The words indicated were not found in the dictionary. They are probably misspelled. If you are not sure, consult a dictionary." In other words, go look it up (and learn) for yourself.

MacProof, which works only with word processing programs, offers broad capabilities for completely analyzing a document, including checking for mechanics (punctuation, capitalization, and double words), usage (racist and sexist words; confused, vague, and overworked terms), style ("be" verbs, expletives, and the passive voice), and structure. This is a serious, all-inclusive document analyzer.

Rather than offer spelling alternatives, the program provides a list of suspect words. When checking for sexist or

racist terms, MacProof provides an explanation of what it considers sexist or racist writing and then either displays a list of the offending words or shows them as they appear in your document. Using the program's ample keyboard shortcuts, it's possible to print the document (at any stage of the analysis) for later correction.

In our spelling test, MacProof flagged 22 words as misspelled. Again, no alternatives were offered. It also caught the incorrect lowercase "i" in the document and flagged the double word "over."

Finally, MacProof's main dictionary (93,000 words) can look up single words independent of a document. You can also add words to the dictionary, but the program has no facility to conjugate regular words. You have to make a separate additions with suffixes if you want the dictionary to recognize all the various permutations.

After trying out myriad spelling checkers, the impression lingers of how sophisticated yet incompetent they can be. With only one or two exceptions, they recognized as correctly spelled such esoterica as "stadium," "aria," and "schmaltz," yet all but DisplayWrite 3, MacLightning, and Thunder incorrectly labeled "remap" a misspelling. Many of these computerized spellers recognized proper nouns and avoided flagging them, yet none was designed to spot improperly capitalized words in the middle of a sentence. And then there were the correctly spelled yet incorrectly used words that escaped all the programs tested: none spotted "Deer," "sea," or "right" and only one highlighted "talc," whereas any business reader would instantly know that you had misspelled "Dear," "see," "write," and "talk" and certainly think the less of you or your secretary.

Cramming more words into spelling dictionaries is not the answer for perfecting checker software. Rather, look for the next breakthroughs to come from syntactical spelling checkers that can recognize words misused in context. Fast access to large blocks of memory, made possible by the new Intel 80386 and Motorola 68030 microprocessors,

will make "intelligent" spelling checkers commonplace, along with accurate translation from one written language to another.

Major improvements with spelling checker technology will almost surely add to the overhead of internal memory and disk storage, unless this feature becomes embodied on a chip of its own to be included in new computers, like graphics and math processing are now.

One step in this direction is Xerox's PC Type Write, a peripheral box a little bigger than a pack of cigarettes, easily connected between keyboard and IBM PC to allow real-time checking of input against a self-contained 100,000-word dictionary (modifiable with 1,200 user words). The dictionary, developed at the Xerox Palo Alto Research Center (PARC) in conjunction with Microlytics, Inc., of Rochester, N.Y., is the only one to include such proper nouns as Alcoa, Amadeus, Berlitz, Dylan, Ike Ektachrome, Forbes, La Guardia, Pepsi, Rutgers, Sanyo, and UCLA.

This same dictionary will soon be available on disk as part of Microlytics' Spell Finder program, to be included in several major word processing packages. A beta version of Spell Finder was used as a memory-resident add-on to WordStar release 4 and tested a screen at a time on the sample letter. It highlighted 26 "misspelled" words, tripping up on "Ms." and "remap." Its correction algorithm worked well, offering a single correct suggestion for "autobiografy," "overacheiver," "Volkswagon," "fo," and "hte," yet failing to suggest any alternatives at all for "skizofrenik" and "Cincerlly." Most impressive was the fact that an entire 100,000-word dictionary was squeezed into 114k of disk space—a twofold improvement on previous compression schemes.

The compression system used for Spell Finder and PC Type Write opens the way for all sorts of dictionary-based functions on a chip. And expect such chips to include the next candidate for becoming a standard feature in word processing—the electronic thesaurus, which will provide synonyms at the touch of a key. ■

That Was Then And This Is Now.



1982

1987

Introducing WordStar® Professional Release 4.

You remember when we first came out with WordStar. From day one it became, as some described it, a classic. Over one and a half million of you snapped it up. But that was then.

This is now.

And now there's a new WordStar. WordStar Professional Release 4 for IBM PC and compatibles. With the same familiar command sequence and file format you've grown to love. Yet with all the improvements you've been asking for.

You're going to have a field day.

With over 125 new features, it's like a wish list come true.

In this industry, a big deal is usually made over 1 or 2 improvements. But over 125! That's unheard of. As is trying to list them all. But just to whet your appetite, we will tell you Release 4 comes with undo, keyboard macros, Word Finder™ Thesaurus, line/box drawing, improved printer support, multi-line headers and footers, and onscreen boldface/underlining.

Word Finder is a trademark of Microlytics, Inc.

Catch your breath. We're not done.

There's also 14 function math, subdirectory support, go to page, and improved spelling correction and Mail-Merge. There's even an optional 40 function key interface. Like we were saying, this one's loaded.

And if you buy early, you get a \$100 rebate.

O.K., how early is early? Well, all we ask is that you see your dealer and buy one of the first 15,000 copies sold, and MicroPro will give you \$100 back* (when you register your product).

*Call 800-343-3000 Ext. 650 for more information or the Dealer nearest you.

It's that easy. And it's just one of the ways you'll find WordStar Professional gives you a good return on your investment.

If you're one of the 1.5 million who already own WordStar or WordStar Professional, pass go and proceed directly to the coupon below. Because for you, we saved the best for last. \$89 and your present serial number lets you update to Release 4. It's our way of introducing a new dedication to our customers. It's our way of saying there's a new MicroPro.

WordStar Professional Release 4.

Let's hear it for new beginnings.



ORDER YOUR UPDATE NOW! Complete the information below and mail to MicroPro, Order Update Department, P.O. Box 7079, San Rafael, CA 94901-0079. Or call us toll free at 800-227-5609 to order or 800-343-3000 Ext. 650 for more information. Allow 3-4 weeks for delivery.

Customer Name _____ Company Name _____

Address _____ Telephone (____) _____

City _____ State _____ Zip _____

WordStar Serial # _____ or include title page of WordStar Reference Manual.

Indicate: _____ 5 1/4 disk format _____ 3 1/2 disk format

Release 4 at \$89.00 _____

Tax* _____

Shipping/Handling \$5.00 _____

Total _____

*Only states shown require sales tax: CA, GA, IL, MA, NJ, OH, TX, and VA.



THE ULTIMATE VISION: EYES FOR THE BACK OF YOUR HEAD.

To see some accidents coming, you'd have to be born with radar. But you're not, so GM is working to give you the next best thing. Radar for your car. The option to "see" all around you, all at once. It's called Obstacle Detection. Just one of the many safety features GM is developing for cars of the future.

Obstacle Detection will operate by sensors strategically placed all around your car which will sense and warn you of obstacles you're approaching, giving you a chance to avoid them.

At GM, we can't prevent all accidents from happening, but we want to help you steer clear of as many as we can.

• ***THE GM ODYSSEY:
SCIENCE NOT FICTION***

GM

COMPUTER CONTROL

5 6 7

SPEED

MPH



44 MILES

WATCH

FRONT

SIDE

REAR

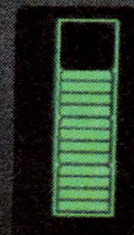


UNLEADED
FUEL ONLY

F

1/2

E



OIL PRESSURE



0 40 80



TEMPERATURE



120 190





UNITED THEY STAND: Jack Healy and Bernadette Connors (left and right foreground), and the Bay Area United Way's telemarketing team used a LAN to revamp its fund-raising efforts.

WHO MANAGES THE NETWORK?

Choosing the right LAN can enhance your department's productivity; finding the right LAN manager is just as critical.

by Henry Fersko-Weiss

You've read about LANs, heard about LANs, and now you've decided that your department is ready for, and needs, a LAN. For the next several weeks, possibly months, there will be an avalanche of technical questions to be answered. What local area network software is right for our applications? What kind of file server should we get? How should the system be configured? What cabling should we use?

You get the idea. But before you become completely absorbed in these issues, consider the fundamental

Contributing Editor Henry Fersko-Weiss wrote the "On-Line Contacts" story in the January 1987 issue.

puzzler: Who manages the network?

It's a vexing question for a number of important reasons. Getting a LAN is a strategic and tricky decision. The networked system affects the day-to-day performance of a department and has an impact on that department's overall performance and productivity. A LAN will also, presumably, become an office fixture, there for the long haul as an integral partner in the short- and long-term growth of your department. Finally, a LAN can be expensive.

Unfortunately, the question of who should manage the LAN begs a tidy answer. Much will depend on where the impetus for the LAN comes from and whether the corporate management information service (MIS) or data processing (DP) department is an active participant in the installation of the network. Also consider whether there is someone in your department who has a solid technical background, and how the new LAN will affect the workload of every individual in your department. Moreover, there are two phases of management that overlap in a LAN installation, and the designated manager may be different for each of the two phases.

The first phase involves planning the system, followed by its physical installation. The second phase focuses on the day-to-day administration of the LAN once it's up and running.

Planning is the most critical element in the first stage, when design and technical decisions are made. What applications will the LAN be used for? How many people will use it? What is the right LAN hardware and software for your needs? How will the system be configured? Where do you actually put the system? And who has access to which files? Resolving these issues is often delegated to the wrong person, and the result can be disastrous.

If the impetus for the LAN trickles down from MIS or DP as part of a larger corporate strategy, then input from any single department may often be delegated to a junior member who takes an inactive role and then simply reports back to the department manager. And even if the inspiration for the LAN comes directly from the department, this stage is still frequently relegated to a junior member, although it may be one who possesses some technical expertise and who is identified as the resident personal computer guru.

"Too often I see a department put an

administrative person in charge of a LAN project," says Mark Freund, vice-president of the Interconnect Network Consulting Group, in Pasadena, California. "It may even be the last person hired out of college, because he or she has had some experience with personal computers. The more I come across this [unwisely delegating the job], the more I see the need for someone who has a firm grasp of the department's needs

Senior group members have the experience and foresight that are necessary to grasp why a LAN is being installed.

and a broader view of its direction."

The people with the best perspective on the department's needs and direction are its senior members—department managers and their immediate subordinates. They have the experience and foresight necessary to grasp why a LAN is being installed while, at the same time, being in touch with the overall direction of the entire corporation. Because the LAN's planning phase establishes the tone for what follows, it is especially important that a senior department member assert control. Planning may only account for 10 percent of the time it takes to install a LAN and to get it running properly, but it is the most important part of the entire process. "The most successful installations are the ones where a high-level management person is integrally involved in the initial scoping out of the project," says Freund.

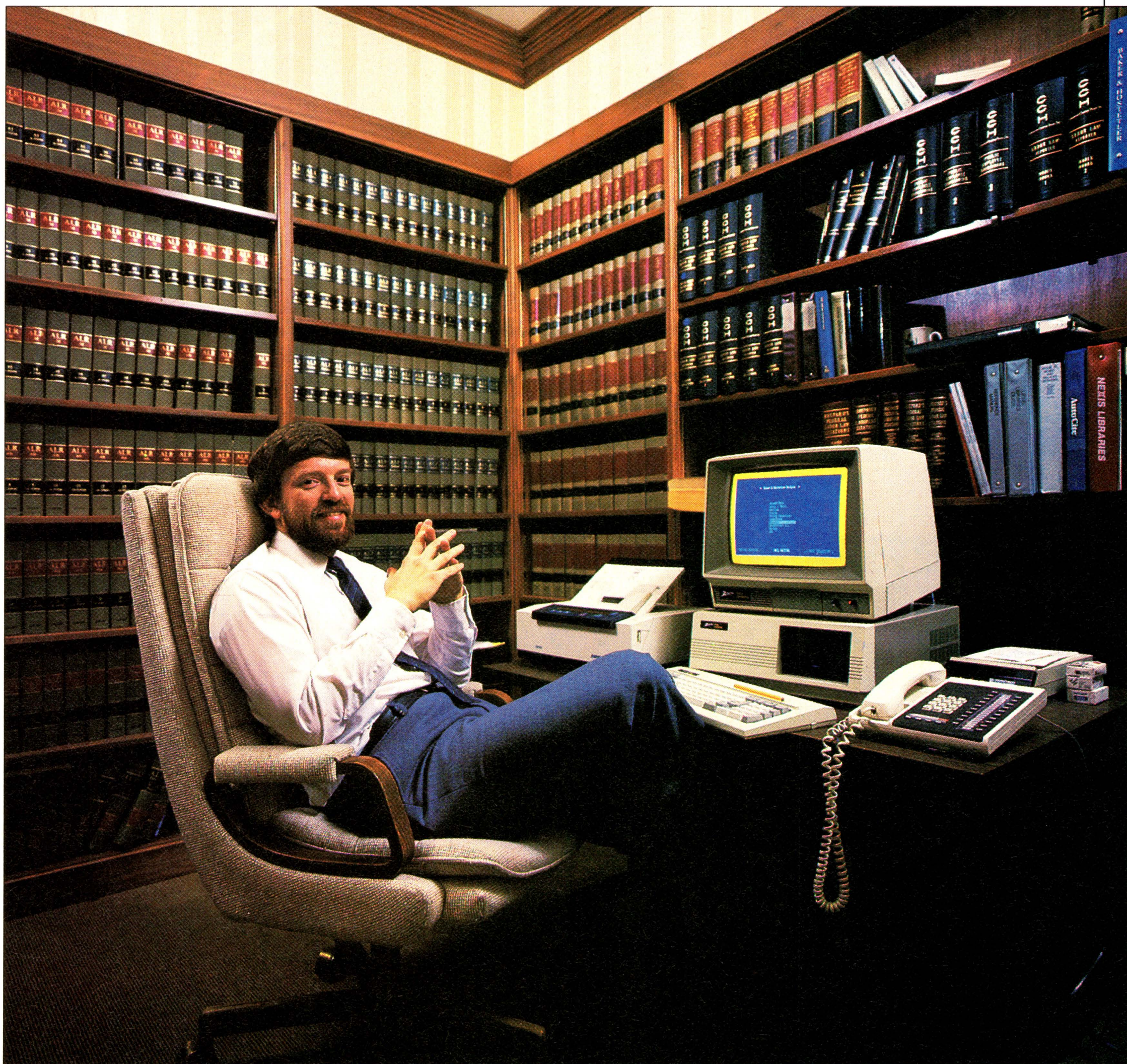
"High-level manager" is certainly the right appellation for Jack Healy, the associate executive director of the United Way of the Bay Area in San Francisco. He managed the planning and installation phase of a LAN project last year be-

cause he was also the manager of a special project that demanded the broad scope and breadth of applications that a network offers.

The Bay Area chapter of United Way realized that its approach to fundraising was out of synch with the dynamic economic environment in northern California. United Way officials decided to establish the New Business Development Group, and Healy was the man for the job. Some statistics on the ever-changing business population point up the urgency of the United Way's project. Two years ago there were about 50 large companies with headquarters in the Bay Area. By early 1986, there were only 25 comparable companies in the area; and more than 15,000 people, once a part of the larger corporate work force, had found employment in small- and medium-size companies—companies that the United Way wasn't reaching with its traditional corporate approach. "We had to respond to the drastic change or lose precious funding," explains Healy. "The answer was a telemarketing and direct marketing program aimed at the people who had moved into the smaller companies—and we needed it fast."

One of Healy's first decisions was to get a LAN. He knew that an intense telemarketing effort required the simultaneous sharing of a common data base. As a foundation for that data base, Healy purchased a Dun & Bradstreet data base with information on 21,000 companies. Because of the extreme time constraints, Healy couldn't wait for his DP department to supervise the technical end of installing a network. Healy turned to Interconnect, Freund's consulting group. "But I managed the LAN project, because the goals of the LAN and the goals of the group were closely intertwined," says Healy. "All the activities of the group, such as lead generation, direct mail follow-up, scheduling of volunteer help, sales tracking, account management, and so on, are all totally dependent on the operation of the LAN. There were decisions to be made on all these applications, so the project [installing the LAN] needed somebody who understood them and how they would support the sales operation. That person was me."

Mind you, Healy banked on Interconnect's advice, because the consulting firm knew how to transform Healy's application needs into the right software and hardware. Interconnect, however, could not have installed the right system for the United Way without Healy's input. "Planning is a fluid proc-



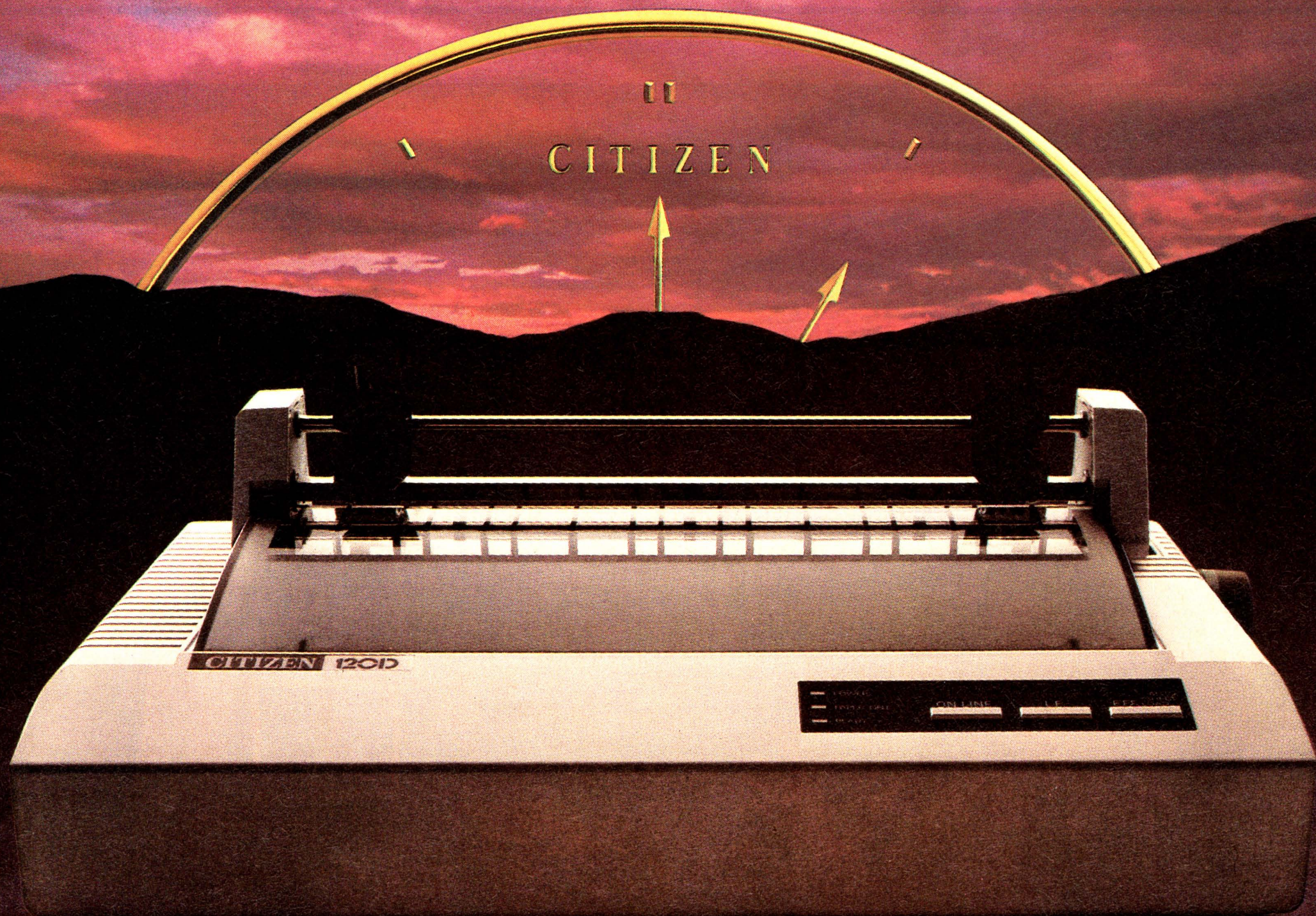
LEGAL LAN: Attorney Bob Ellis, Columbus, Ohio, can now strike a comfortable pose after he grabbed the initiative and explained specific network options to the firm's partners.

ess," says Freund. "As you go along there are bound to be changes, and you need someone who understands the project intimately to keep it on track." The United Way's network finally went on-line using Novell's Netware in an IBM Token Ring configuration. It has been up and running smoothly since this past June, and is now the backbone of the United Way's revamped fundraising efforts.

There are exceptions to the general rule that the manager of the first phase of a LAN installation should be a senior member of a department or an executive. If the LAN serves a number of de-

partments, then it may be prudent to keep its management under the auspices of the DP or MIS departments—which will most likely be supervising the LAN's actual installation. Interdepartmental needs and the possible connection of the system to the corporate mainframe makes a person with a technical background the logical choice to serve as the overall project manager. You should also be aware, in this example especially, that it's important to have an advisory group comprised of senior department members to ensure that the applications needs of each department are not overlooked.

It also makes sense to cede LAN management to data processing people if your department requires original programming for the system's applications. A keen technical eye will ensure that the application software is properly mated to the network's software and hardware. For example, a large Midwestern bank, which was wary of its competitors figuring out how it was using networks, assumed the following tack for its installation. "The initial phase of the project included a fair amount of programming, which the department people were obviously not qualified to do," says Bob Parenti, a



FOR PEOPLE WHO WANT MORE, BUT AREN'T WILLING TO PAY THE PRICE.

Citizen™ just took all the features of a high-end printer and made a small change.

We put them into a low-end printer. The Citizen 120D.

We created a dot matrix printer with more features and a lower price than any other printer in its class. One that produces clean, precise letters at a draft speed of 120 cps, with superior correspondence quality at 25 cps.

We added little extras, like a 4K-byte buffer, proportionally spaced printing, full graphics capabilities, and a unique paper loading system that's a small wonder. And we gave it the ability to survive the long run with most leading computer systems.

Because after 50 years of placing a world of precision on your wrist, we've come to realize something. Good things do come in small packages.

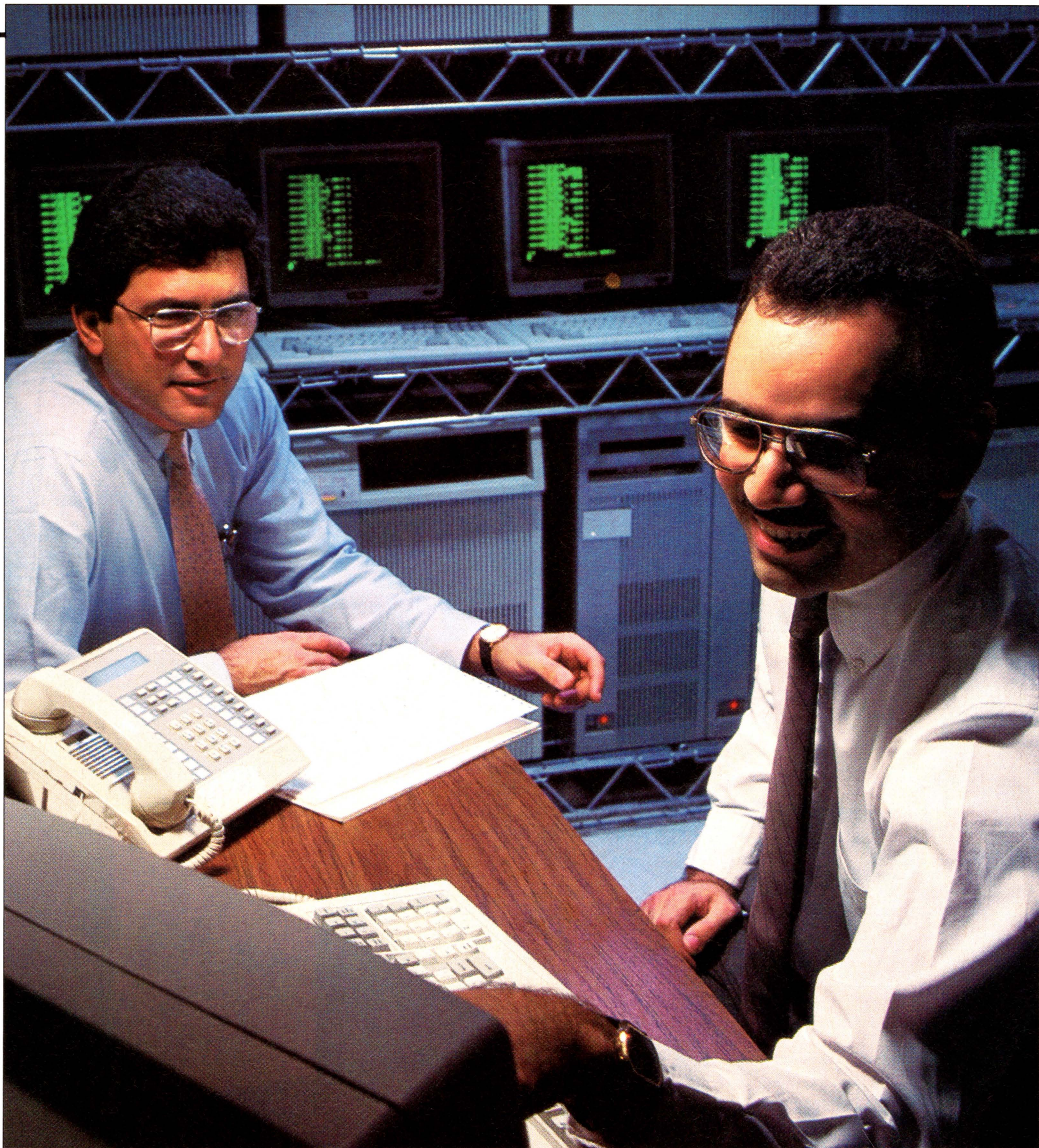
For more information, call 1-800-556-1234 Ext. 34. Or in California, call 1-800-441-2345 Ext. 34.

The Citizen 120D. Never has so much been offered to so many for so little.



Printers that run like clockwork.
(For More Information Circle 3)

©1986 Citizen America Corporation. Citizen and the Citizen logo are trademarks of Citizen Watch Company, Ltd.



DEDICATED MANAGEMENT: Standard & Poor's business systems director, Julio Menendez (left) recognized the need for an overall LAN manager and appointed José Rosario to the new position.

senior consultant in the bank's information systems department.

The person chosen to manage the LAN worked as a programmer in another department. He was hired directly by the user department, because that's where the budget dollars were. "We knew him," says Parenti. "We knew he wanted a change, and that he was familiar with dBase III—an important part of the system—and we had the confidence that he could do a good job."

There's another reason why a programmer was hired to work directly in the department where the 3Com LAN resides—it is 30 miles away from the in-

formation systems department where Parenti works. Even though Parenti has remote access to the LAN, he says that having the LAN manager on-site to answer users' questions as problems arise is a superior solution.

The LAN manager is still putting the finishing touches on the programs for the department's new system. When that phase is complete, he will bring each departmental user up to speed on the new applications. At present, the workload enables the LAN manager to remain as a full-time employee in the department. When the chinks are finally ironed out—as most LAN problems,

no matter how troublesome, inevitably are—the manager will move elsewhere in the information systems group. At that point, he will administer the LAN from a remote location, or perhaps train a department member to take his place as the front-line LAN administrator.

Another exception to the rule of using senior department members to manage the first phase of a LAN installation occurs in professional companies, such as law firms, real estate concerns, or group medical practices. Management at these companies, in general, is by committee—a group of senior partners, perhaps in conjunction with an office manager

Release The Graphic Designer In You With PrintMaster Plus



Grand Opening!

A Partner in Design

Jump into the creative process anywhere you choose — graphics, format or copy. PrintMaster Plus is exceptionally flexible. And with over 100 pieces of clip art, 10 type fonts in 5 styles, and 11 border designs to select from, you'll have an endless variety of creative choices to make.

Best Of All ... The Price!

PrintMaster Plus is very affordable graphic design software. So now you *do* have the time *and* the budget to develop the undiscovered graphic designer in you!

To get your copy of PrintMaster Plus, just ask your local computer dealer.

Available on MS-DOS compatible computers: Commodore Amiga, Atari 520 ST, Commodore 64/128, and Apple II computers.

Time and time again, you've wanted to create exciting banners, posters, greeting cards, stationery, or calendars. If only you had the time *and* the budget to complete these projects yourself, you would! Well, now you can. Thanks to the creative power in *PrintMaster Plus* — the innovative new graphic design software from Unison World. In just a matter of minutes, you'll be able to see your great graphic ideas in print!



Unison World

2150 Shattuck Avenue, Suite 902
Berkeley, California 94704
(415) 848-6666

Unison World is a division of
Kyocera Unison, Inc.

who oversees ongoing administrative or clerical work. Since these senior professionals are usually addressing the requirements of their important clients, it's not possible for them to partition blocks of time devoted exclusively to supervising a LAN.

The professionals in this type of situation have two choices: Appoint a senior administrator (such as the office manager or head bookkeeper) to manage the LAN, or give responsibility for overseeing the LAN to a junior professional member of the company. There are other important factors to consider, such as who will be the primary LAN users—administrative or professional personnel—and who in the office has the most experience with personal computers. The logical choice in this situation is an employee who will be spending the most time using the LAN, because it's likely that this person will have a firm grasp of the needs and problems that other LAN users will encounter. Also, it's often the case that the person who originally touted the LAN ends up managing the installation, not necessarily by default, but more as an expression of genuine interest and curiosity. It's important to recognize that personal initiative can play a positive role in the overall management of the LAN.

When the law firm of Gingham & Christensen in Columbus, Ohio, decided to replace the aging mag card typewriters used by its support staff, one of the firm's lawyers, Bob Ellis, began lobbying for a LAN. "I had spent a year in a New York law firm and watched them make poor systems decisions," Ellis says. "I didn't want to see it happen again, so I started writing memorandums to the partners explaining their options and recommending a LAN." Ellis had some programming background and understood the capabilities of LAN technology.

Finally, the firm gave the green light to Ellis and his LAN plan, offering him the job of managing the project. The total cost of the installed network was in excess of six figures. "Once I got involved, it was like quicksand," says Ellis. "But it was my system and I loved it." By the time he was done installing the Fox Research 10 Net LAN, there were 22 nodes on the system.

As Ellis' involvement in the planning and installation of the network increased, he discovered, perhaps to his

chagrin, that this phase of the LAN installation was more time consuming than he expected it to be. It's a factor that every LAN manager has to address and somehow overcome, says Interconnect's Freund. "You have to shunt your normal work off to someone else or work overtime," he says.

Ellis did both. By his own estimate, he devoted about 600 non-billable hours getting the LAN established—

It's often the case that the one who originally touted the network ends up as the overall manager of the installation.

including logging time after-hours and on weekends. Overtime aside, Ellis would never have been able to wear both hats if the firm hadn't tempered his normal workload by about 20 percent. To be sure, the time he devoted to the first phase of the LAN project detracted from his practice of international and computer law. To his credit, Ellis didn't resent the additional burden—actually, he's quite proud that his efforts have been a boon to the firm as well as a learning experience. Today, the system only requires 30 minutes of his administrative time each week.

Ellis' responsibilities now include the second LAN management phase. It's inevitable that the management responsibilities will evolve once the installation is complete. The technical issues have long since been resolved, unless, of course, new applications must be added to the system. Adding a new application to the LAN should be considered as an independent project that has its own phase-one management needs. Phase two management is comprised of adding new users to the system, answering users' questions, getting the system re-

started if it fails, acting as the liaison to the manufacturers or vendors of the software and hardware, backing up the shared data bases, and making sure the file server isn't overburdened. In general, LAN experts and managers say these administrative functions require no more than 10 to 15 percent of a normal work week. It's a job that can easily be handled by a user of the system. Indeed, it should be.

"Once a LAN is in place, most of the management function is a matter of answering users' questions and troubleshooting system problems," says Dan Marshall, a technical instructor with Novell, maker of the Netware LAN. "It should be somebody who may have encountered the same problems, not only with the LAN but with the application software as well. Somebody who knows what a user is trying to do. Since this person will also have to train new users, it's a more natural and productive process if these people work together on a daily basis."

System security is also a significant issue, especially when your department deals with sensitive data, such as personnel records, salary information, or corporate information. Making sure that LAN management resides within the department adds an extra layer of security to the system, even though the LAN administrator has access to every record and file on the system.

The person who manages the second phase of a LAN project is usually called the system administrator. The term accurately reflects the reduced management requirements at this stage. This job doesn't require a senior department member, nor does it require the technical expertise of a data processing person. In fact, an administrator's duties are often so simple that they soon become mechanical. For example, Freund mentions the eye-opening system used by a large Dutch company: "Although I don't believe this is the right approach, the company has the night cleaning people back up its LAN—that's how simple the network is."

The primary requirements for the system administrator are a technical aptitude and a willingness to help other users. It's useful if the person chosen is experienced with personal computers, but it's not essential. All the manufacturers of network software offer a variety of training programs for systems administrators. Another prudent training approach is to get the administrators immersed in the project as phase one is transformed into the actual installation stage, after all the planning is complet-

Save \$100!

Buy Both!

Now you can purchase Diagram and Picture Perfect as a set for only \$590, a savings of \$100.

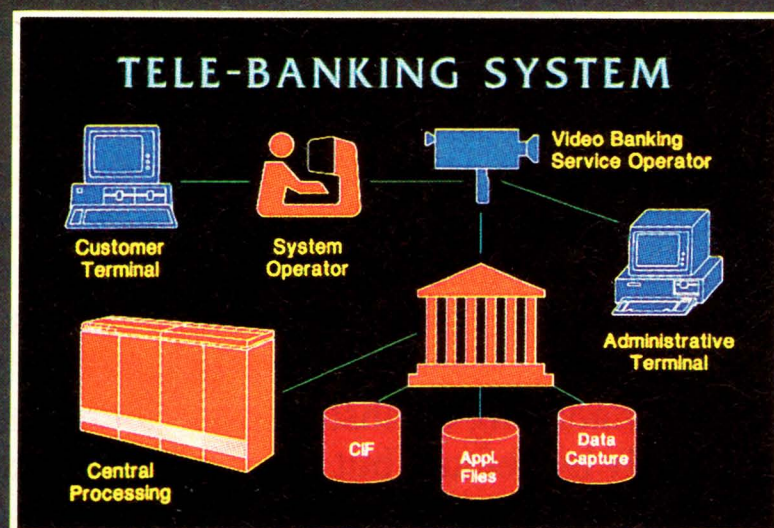
And if you order the set before May 15, 1987, we'll give you 5 extra typefaces free-of-charge (a \$125 value).

Only \$590

Diagram®

Create presentation-quality diagrams, maps, flow charts, signs, forms and organization charts — quickly and easily.

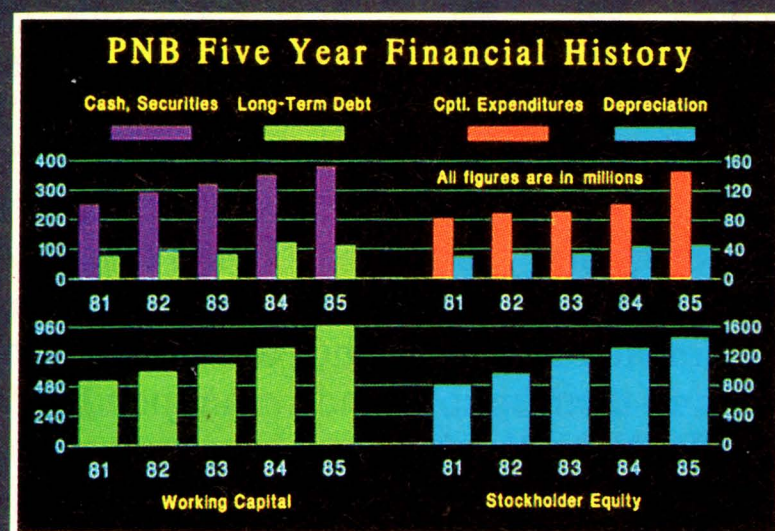
Only Diagram comes complete with over 2,200 high-resolution, graphic-art symbols and thirteen typefaces. Over 3,000 optional symbols, dozens of typefaces, company logos and custom libraries are also available - \$395.



Select from over 5,000 symbols and add visual interest to your charts and graphs.

Picture Perfect®

Turn stacks of facts and figures into pie, bar, line and combined bar / line charts. Enter data from the keyboard or read files produced from any of the popular spreadsheet and data base products - \$295.



Only Picture Perfect offers you bar / line charts with four independent y-axes.

Diagram and Picture Perfect are available for the IBM PC/XT/AT and compatibles. The IBM Enhanced Graphics Adapter (EGA) and a wide variety of printers, plotters and film recorders are supported.

Computer Support Corporation
2215 Midway Road
Carrollton, Texas 75006
(214) 661-8960

(For More Information Circle 50)

Picture Perfect is a registered trademark of Computer Support Corporation.
Diagram is a registered trademark licensed to Computer Support Corporation.
IBM is a registered trademark of International Business Machines Corporation.

ed. "By involving the administrators in the installation, you give them a chance to learn the system inside out," says Freund. "That helps when a problem has to be diagnosed. It also lets the administrator become familiar with the people who represent the vendors." As phase one nears completion, the LAN manager has an opportunity to begin delegating more responsibility to the system administrator.

A willingness to assist network users is an important trait for an administrator to possess, especially since he or she will often be dealing with users' problems. "The administrators have to get personal satisfaction from improving the way people in the department do their jobs, or it can be too much of a strain," says Bob Rolla, OEM marketing manager at 3Com, which has installed about 30,000 of its Ether series networks.

Department managers have to be especially aware of the signs of administrator burnout. The first administrator Healy used for the United Way LAN simply couldn't cope with the strain of performing two jobs. The present administrator, Bernadette Connors, has begun to show some signs of being overburdened by her dual responsibilities. "She's got a job and a half," Healy says. Connors puts in two-and-a-half hours a day as the network administrator, while the balance of her 60-hour week is spent as the office manager, analyzing research data on company prospects and producing reports. "I haven't decided what to do about it yet," Healy says. "I might take the telemarketing management away from her or simply hire an administrative assistant for her."

A partial solution that is under consideration is for Healy to send a member of the United Way's DP department to the administrator training course offered by Novell. Then, at least, Healy's department would have an expert in the on-deck circle in the event that Connors is too involved in a telemarketing project. "Having somebody in data processing who understands the LAN will also help Bernadette if she runs into problems that are too technical for her," Healy says. "This will give the administration of the LAN good balance."

A backup person for the system administrator makes good business sense for a number of other reasons. What happens if there are problems with the

LAN while the administrator is out ill or on vacation? "It's always a good idea to cross-train a second person," says Donald DiBrita, the national director of professional support services for Nestar Systems, maker of the Plan 3000 LAN. "My basic philosophy is to back up every aspect of business, not only LAN management. That way, you are prepared for any eventuality. And, if the LAN should become too big for one ad-

Managers have to be aware of administrator burnout—people who can't cope with the strain of doing two jobs.

ministrator, you can off-load some of the responsibility to the backup administrator." This backup person can be another LAN user or a data processing person. A DP representative is preferable because technical problems will not be beyond his or her expertise.

Under some circumstances, the administration of a LAN will rest with the MIS or data processing department. Even then, there should be a departmental user liaison. When LANs become very large, span several departments, or are important to the daily operation of a company, then the management typically rests with the MIS or data processing department. "The basic question to ask is: 'If the LAN goes down, does it have an impact on the whole business?'" asks Vern Yates, the vice-president and general manager of the personal computer division of NCR Corp., maker of the PC2PC LAN.

"If a LAN is used for order entry or billing or some other daily production process, then it should be managed in a highly structured environment," continues Yates. "What this environment is depends on the style of the organiza-

tion. If it's a centralized company, then the LAN will almost certainly be managed out of MIS or a like department. In a decentralized company, the management will come from some other functional group, such as office automation, or office management, for example."

An example of a decentralized company is Standard & Poor's in New York. The company has two large Nestar Plan 5000 LANs in its debt rating department, and each LAN has several work groups on it. The larger of the two LANs, for instance, includes the international group, the financial institutions group, and the industrials/utilities group. The financial institutions group alone has 62 users, and there are a total of about 150 users on that LAN. The overall network manager of the LAN, a newly created position, is José Rosario. This past October, before he was appointed as the network manager by Julio Menendez, business systems director, two other systems administrators shared the responsibilities of applications support and network support. "The LAN was taking away too much time from the applications work," says Rosario.

Rosario is in the systems group dedicated to debt rating. His function with the LAN is to handle configuration issues, analyze major problems with the LAN and restore it if it goes down, allocate space on the file servers, and so on. There are local administrators at the group level—senior analysts in each planning group. They will address and implement the needs of the users in their area, install special applications, modify applications, and answer users' questions. It's nearly a full-time job.

Standard & Poor's has a third group (the minicomputer group) to oversee the backing up of the LAN. This group simultaneously performs minicomputer and LAN backups.

LAN technology is maturing rapidly. Systems are becoming more reliable and easier to connect. As these improvements accelerate, LANs will require improved management in the first phase of installation because they will be both more powerful and more flexible strategic tools. The LAN will also require less administration in the second phase because there will be fewer glitches.

The better LANs become at performing tasks, the more important it will be for managers to designate a senior department member to become involved at the genesis of the project, and the easier it will be to delegate administration to a more junior user once the system is up and running. ■

PRINCETON. The finest dot pitch* in EGA monitors.

*And the finer the dot pitch,
the sharper the image.*



For the no-compromise enhanced graphics monitors, look for the Princeton Graphic Systems name. Princeton delivers everything you need in a quality EGA display, from crisp, clear, full EGA support to rugged reliability. When you choose Princeton you choose the best.

HX-9E. The first IBM compatible 9" high resolution color monitor to support EGA. Has a .28mm dot pitch black matrix tube and etched nonglare screen for sharp, crisp displays and features a built-in tilt/swivel stand and green/amber switch.

HX-12E. The first IBM compatible high resolution color monitor to support EGA with a .28mm dot pitch. The HX-12E builds on the award winning features of the HX-12 and features 640 x 350 resolution for sharp, crisp text and colorful graphics.

And much more:

Full EGA and CGA support. Princeton EGA monitors bring you 64 brilliant colors and bright sharp images in enhanced graphics mode, with 640 x 350 resolution. Your EGA software never looked better. Plus our HX-12E and HX-9E automatically switch from EGA to CGA mode, when needed.

Compatibility. Princeton monitors are 100% compatible with leading personal computers like IBM®, Compaq®, and more. No matter what system you have, there's a Princeton monitor that's right for you.

Quality Image. A .28mm dot pitch (the finest dot pitch of all leading EGA displays), bright colors, and sharp resolution give Princeton monitors a quality image that cannot be beat.

Easy Viewing and Ergonomic Design. Princeton monitors are designed for easy use, too. You get easy viewing with the HX-12E's black matrix tube and etched

nonglare screen. The lines are crisp, the characters sharp, and the colors even, so you're more productive. Controls are located on the front, where you can reach them.

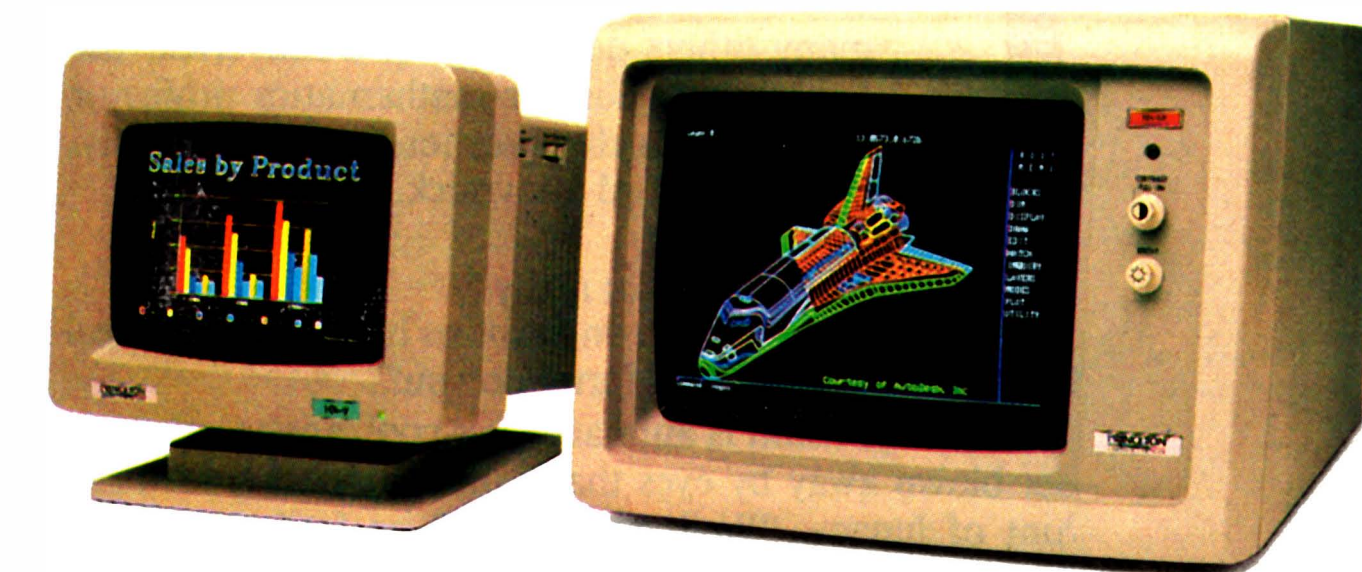
Reliability. Princeton monitors are designed and manufactured to meet your most demanding needs. Only the finest components are used. The result: dependable performance day in and day out.

Value. No other monitor gives you more for the money than Princeton. Compare for yourself. Feature for feature there's not a better value around.

Availability. Princeton monitors are as easy to get your hands on as they are easy to use. You can find them at computer stores around the world.

Reputation. More and more, people are making Princeton Graphic Systems their number one choice in personal computer displays. Because people know Princeton delivers the ultimate in compatibility, reliability, and performance.

*Dot pitch is the measure of the distance between phosphors of like color (dots) on the display screen. The smaller the dot pitch, the closer the dots are to each other. Thus, there are more picture elements which can be displayed on the screen which results in a higher resolution.



PRINCETON®
GRAPHIC SYSTEMS
AN INTELLIGENT SYSTEMS COMPANY

IBM is a trademark of International Business Machine, Inc. Compaq is a trademark of Compaq Computer Corp.
Wall Street Journal is a registered trademark of Dow Jones, Inc.

601 Ewing Street, Bldg. A Princeton, NJ 08540, Telex: 821402 PGSPRIN, (609) 683-1660, (800) 221-1490, Ext. 83

(For More Information Circle 16)

The quirky paradox between a sense for business and a flair for the outrageous has helped to propel Philippe Kahn and Borland Int'l into the forefront of the industry with novel marketing plans and economical software.

PHILIPPE KAHN, PRESIDENT OF BORLAND

The Maverick

Philippe Kahn, the 34-year-old president of Borland International in Scotts Valley, Calif., has kept his cool so far—contrary to his reputation as the flamboyant, outspoken champion of low-priced software. Asked if he feels, as many others do, that he is a maverick, the French-born former mathematics professor breaks down the question, coolly, logically.

"Define for me the word 'maverick,'" he says.

"Maverick" is defined.

"I dunno," he says. "Not really."

Then he is asked: "But, on the other hand, you don't feel any compunction to conform, do you?"

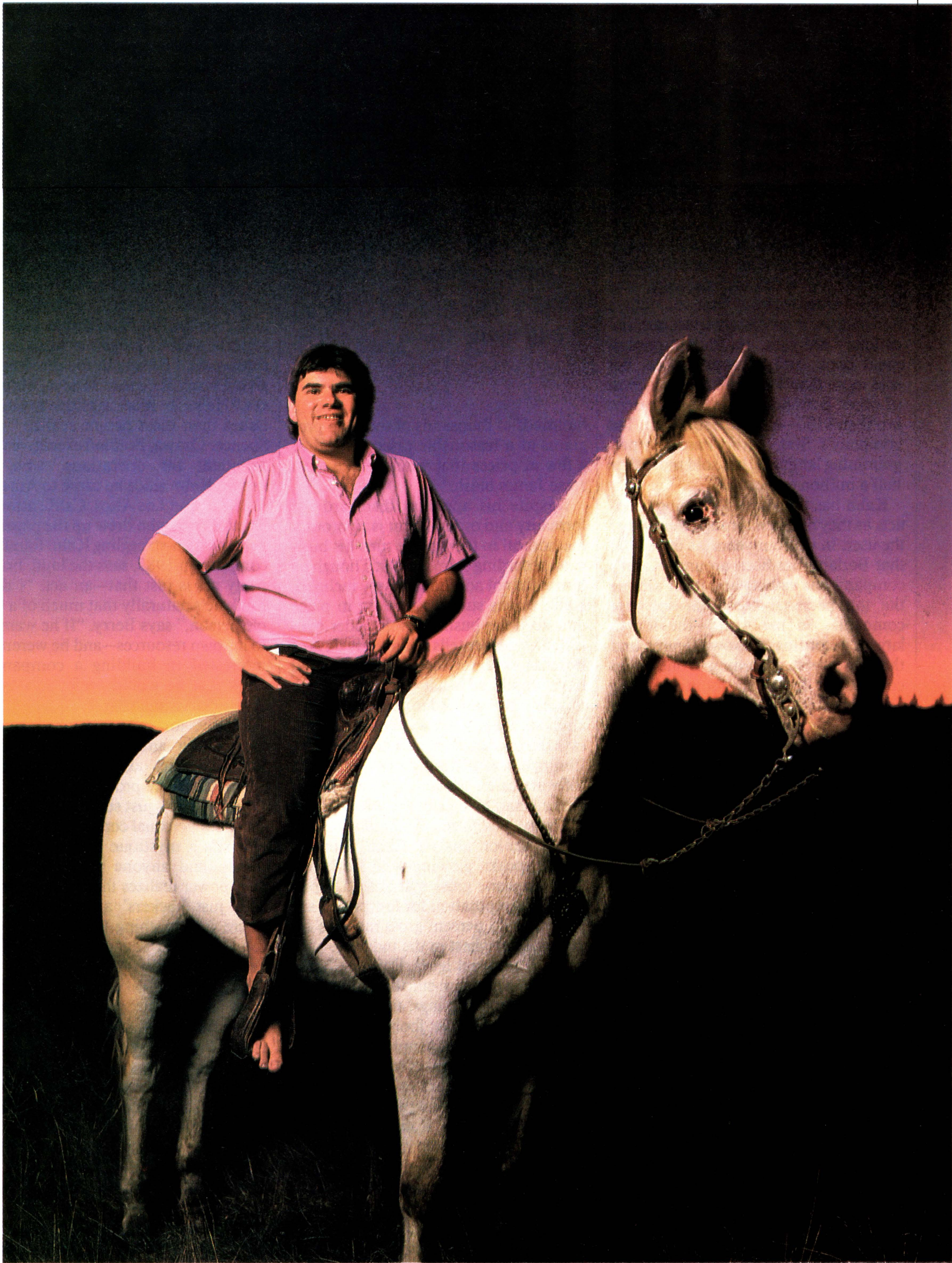
Suddenly, Kahn is animated, his cool, analytical manner blown away by eyes that dance with his trademark hint of lunacy. "Well, you know!" he fairly explodes, "there was a time when everyone thought the universe was revolving around the earth. I feel it would have been an honor to have been a maverick, to think that the earth was actually turning around the sun. People get in trouble for things like that. So sometimes, yeah: I would say that when I'm in the middle of conservative people, I feel liberal. Conversely, when I'm in the middle of liberal people, I personally feel conservative.

"Is that being a maverick?" Kahn asks, summing up. "Well, that's merely the way I am."

Indeed. It is Kahn's peculiar mix of rigorous logic (which shows up more in his products than in his own be-

David Garfinkel is a freelance business/technology journalist who makes his home in San Francisco.

**by
David
Garfinkel**



havior) and outrageous fanfare (which friends say is more public show than the private person) that has earned him a highly visible spot among the personal computer pioneers of the last 10 years.

As an industry figure, he is credited with having exerted a significant influence. "He created and defined low-cost utility software," says George Morrow, an early computer entrepreneur. Dan Bricklin, who designed the VisiCalc program, which more than anything else, fueled the first personal computer sales starting in 1978, says that Kahn single-handedly "legitimized mail order software."

Borland's SideKick package, the RAM-resident utility that includes a notepad/word processor, telecommunications program, calendar/appointment book, and other functions, has sold more than 1 million copies. A host of other Borland offerings—all priced less than \$100—have also sold well. The company's first, Turbo Pascal, a programming language, has sold more than half a million copies.

Kahn has the knack for seeing products as they are seen through the eyes of the user. In the four years (as of May 2) that Borland has been around, Kahn's company has established itself among the top personal computer software companies in the world—the fourth largest, according to its own figures, and the fifth largest, according to one major competitor. In the six months ending September 30, reported in December (Borland stock is traded on the London Unlisted securities exchange, which requires six-month reports), Borland chalked up profits of \$1.8 million on sales of \$14.4 million.

But in his short tenure in this young industry, Kahn has already racked up an impressive list of bewildering contradictions. Untangling these will further help in getting to know this leader, who is expected to continue to have an impact on what you use on your personal computer, and how you use it, in the immediate future.

Probably the biggest paradox about Philippe Kahn is his seemingly chaotic manner, contrasting so sharply with the company that he keeps running, in fact, like clockwork. The consummate rebel-without-a-tie, Kahn often gives the impression of not giving a hoot about anything that might include the word "businesslike." In one 1985 advertisement, Borland proclaimed, "We're not greedy. We believe that it is better to sell

Kahn has a genuine fascination, bordering on reverence, for personal computers. 'There is a mystique about those machines,' he says, 'And anyone who experiences their power realizes they're more than just hackers' and nerds' tools.'

hundreds of thousands of software programs at a reasonable price instead of a few at prices that would make even Jesse James blush."

Despite his apparent disregard for formality and order, Kahn is rigorously methodical in the way he runs his business, according to an insider. Though he himself is not administratively inclined, Kahn makes sure systems are in place that keep the business well under control. The insider tells of the early days of Borland, when a casual visitor would have wondered what was going on at this mostly mail order company—or if anybody *knew* what was going on. Yet, says the insider, "Beneath the casual air, Philippe was getting daily reports on software sales, broken down by magazine ad, and by type of response."

Today, *California Technology Stock Letter* senior analyst Lissa Morgenthaler speaks glowingly of Borland's "just exquisite gross margins." Despite Borland's reputation for low prices, she says, its 83.5 percent gross margins are among the highest in the industry.

On a personal level, Philippe Kahn presents even more startling contradictions. In public settings, especially, he is known not to suffer fools gladly. "I've seen him be rude to people for reasons I don't understand," says Morrow. "But I believe it is an effort to be instructive about a way of thinking as much as anything else." Further, Kahn comes across on podiums at industry meetings as irreverent and outrageous, and is well known for throwing wild parties where he will personally play in the band. (He usually plays saxophone, although he also plays guitar, piano, and drums.) At a convention, reminiscent of John Belushi's blockbuster movie "Animal

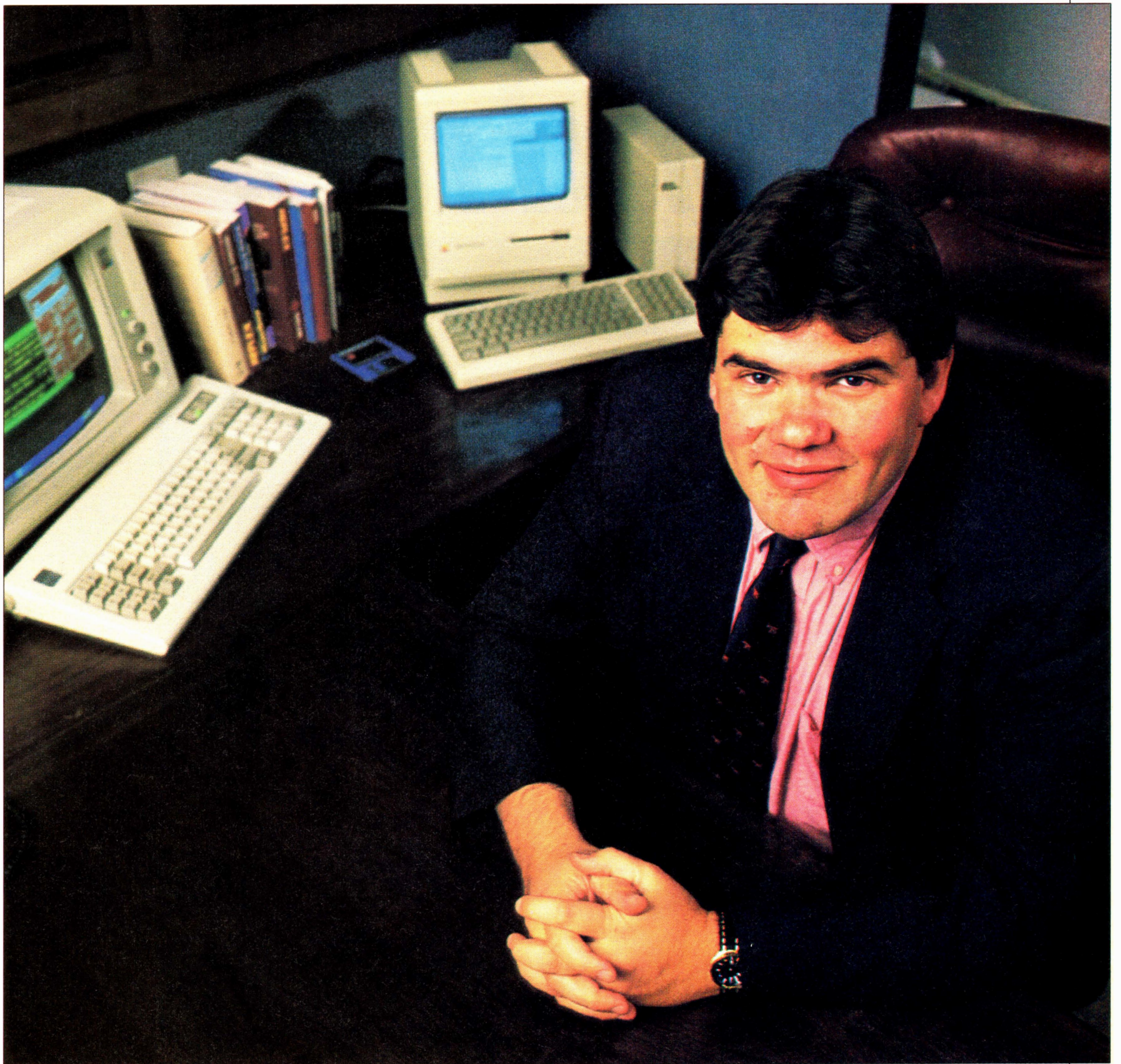
House," Kahn once threw a toga party. And in a *Time* magazine profile, he is pictured sitting outdoors and grinning, almost maniacally, holding his saxophone on a bare knee. The president of a major software company is wearing shorts and a loud Hawaiian shirt.

Yet those who know him well say that this party-animal public image has little or nothing in common with his private personality—save that he really is a musician. Several friends say he's basically "sweet," normally shy, and generous to a fault. Insiders say that while he's a hard bargainer with the outside world, he leans in the direction of giving away the store to loyal employees. "He's a lot more sensitive to human issues than most people realize," says Spencer Ozawa, Borland executive vice-president for operations, who has known Kahn since he came to America in 1982. And Los Altos, Calif., attorney Frank Berry, who drew up the papers to help the then-struggling Kahn found the company in 1983, says the loud, brazen party act is just that—an act. "I don't think he's naturally that much of a people person," says Berry. "If he were left to his own resources—and he weren't so interested in building a company—I think that he would prefer to stay on CompuServe and chat."

Finally, for someone who projects such a flip and irreverent attitude, Kahn is in fact quite reverential about the machines he provides software for. "I think there's just something fascinating about personal computers," he says. "There's a mystique about those machines, and anyone who experiences their power realizes they're much more than just hackers' and nerds' tools. There is something there that allows you to expand *your* personal capabilities and power."

By the same token, he doesn't take every aspect of computing too seriously. Concerning his own Turbo Pascal, which has sold, amazingly for a programming language, half a million copies, "I can't believe there's half a million serious programmers," he says. "I think most people do something with it, to try it. Just like a lot of people have bought guitars in their lives, and play a few chords. Most of them didn't become concert players, but they did have fun."

There are a number of explanations for these contradictions. One explanation is cultural. "He is a European," states Borland director David Heller,



who also represents British financiers in Silicon Valley. "French people, on the whole, are very much like Philippe. Generally, the French are a little more showy than Americans. Philippe will say things that shock people, just to get them to respond to him. But he's not malicious."

Another explanation has to do with strategy—for some reason, Kahn believes that he's one step ahead by keeping his competition off-balance. Heller confides, "Philippe once said to me, 'As long as they think I'm mad, we're at an advantage.'" Adds Stewart Alsop, publisher of the Redwood City, Calif., *PC Letter*. "Philippe loves keeping people

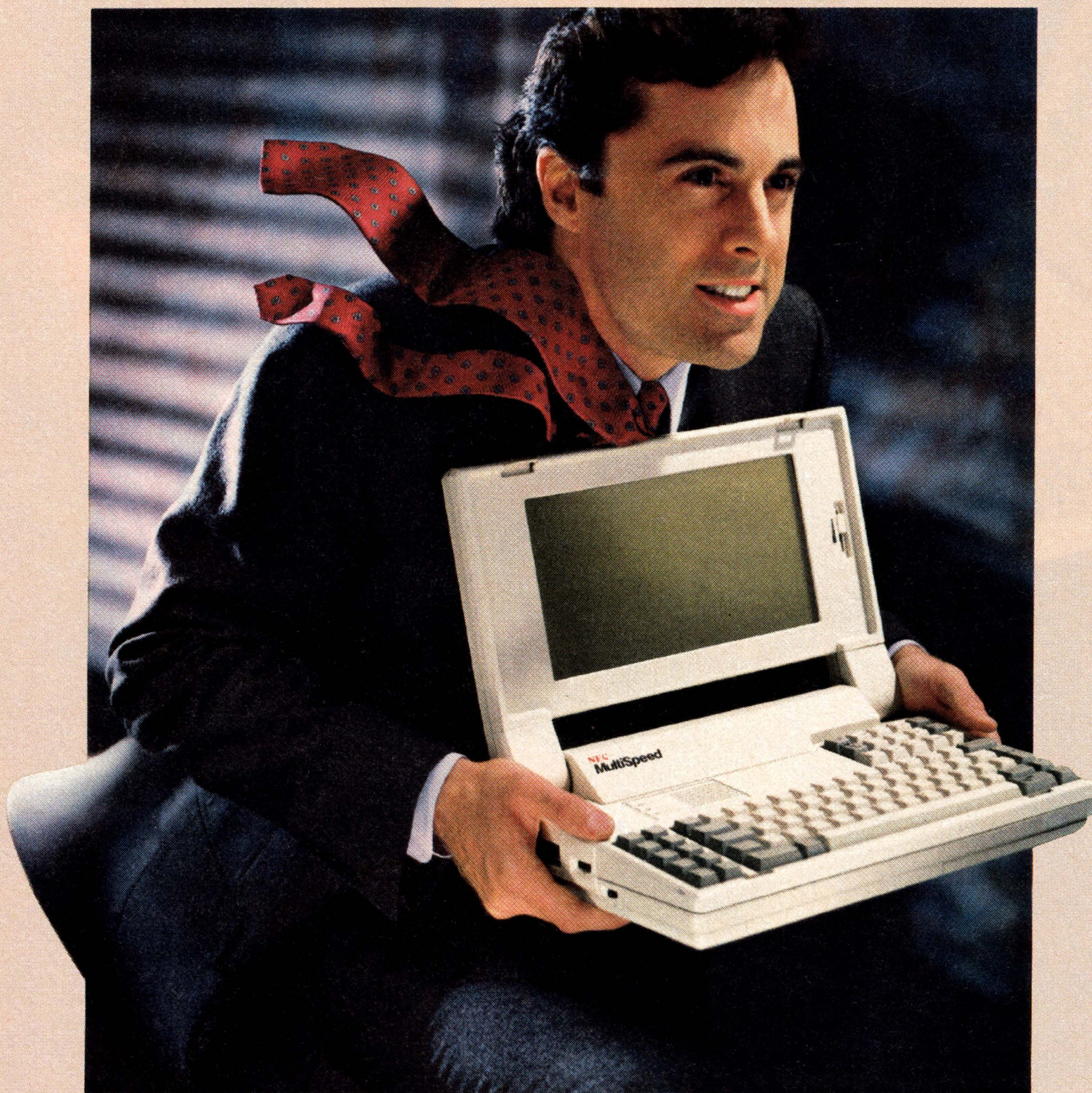
off guard. A lot of people think he's a flash in the pan, and he loves for them to think that."

And a third explanation involves vindication. Kahn truly operated at a disadvantage at the start, in part because he is a foreigner and could not get a green card, which would have allowed him to work legally in the United States. (He finally got one in October 1985, long after Borland was a going concern.) A few months before that day in October, negotiations between McGraw-Hill and Kahn, to have the large publisher acquire Borland, essentially fell apart.

That was the day the *Wall Street Journal* published a story about the

Frenchman on its front page, pointing out that he was an illegal alien. And that was but one of many rebuffs Kahn endured, according to attorney Berry. "He got insulted by just about everyone around in 1983," he recalls, "whether it was passively, by people who wouldn't return his calls; or actively, by some others who just proposed ridiculous deals to him; or very aggressively, by a couple of people who liked the company but didn't think he should be president. So at the moment he enjoys emphasizing how eccentric the company is." In reality, says Berry, Borland International is anything but eccentric: "It couldn't have succeeded if it were like that."

Take the Multi and run.



NEC introduces MultiSpeed™. The world's fastest portable computer. It's designed to make you a runaway success.

MultiSpeed is multi-talented. It's small. Light. And gives you the option of running at a clock speed of either 9.54 or 4.77 MHz.

MultiSpeed can do most anything your desktop PC can. It has the most advanced LCD screen technology. So it's easier to read.

What's more, it's PC compatible and even does windows.

And MultiSpeed is a very smart buy. It comes with a bundle of built-in features that cost a bundle on other portables.

In fact, when you discover everything it comes with, you'll be delighted at what it goes for.

So if you're a person who's going places, try the portable that helps you get there ahead of everyone else.

You'll find MultiSpeed at Bell Atlantic Business Center, CompuMat, CompuShop, ComputerLand, Connecting Point and Micro Age. For the location of your nearest dealer call 1-800-447-4700.

If you have any questions or would like technical information call 1-800-NEC-SOFT. Or write NEC Home Electronics, Computer Products Division, 1255 Michael Drive, Wood Dale, IL 60191-1094.

Standard Features	
Clock Speed	9.54/4.77 MHz
Memory	640K bytes
Built-in Software	5 programs
Disk Drives	Dual 720K (3.5")
Screen type	Super-twist LCD
Keybd. Compatibility	IBM PC/XT*
Numeric Keypad	Separate
Weight	11.2 lbs.

*IBM PC/XT is a registered trademark of International Business Machines Inc.

**Take the Multi and run.
MultiSpeed™**

C&C Computers and Communications

NEC®

(For More Information Circle 43)

When Kahn first started marketing Turbo Pascal by mail order in November 1983, for \$49.95, other versions of the Pascal programming language were selling for several hundred dollars. Because the magazine ads looked good and the software worked well, it quickly became a big success—and controversy ensued.

Of course, the move was hardly controversial with the people buying the product—what customer could argue with low prices? Dr. Paul Gallop, a Harvard Medical School professor and also head of the Laboratory of Human Biochemistry at Children's Hospital in Boston, was Kahn's first mail order customer for Turbo Pascal. Subsequent massive sales of Turbo Pascal launched the company. Gallop says that since then he has bought every new product the company has released. "I think Borland is great because they've forced prices down," he says.

But at the time, others felt Kahn had broken an unwritten agreement within the industry—that quality PC software of *any* kind should cost at least several hundred dollars. Therein lies the controversy: Did Borland force prices down or did the company create a new price level in the software market where some programs fit and others don't?

The answer depends very much on whom you ask. Ashton-Tate's president, Ed Esber, whose dBase and Framework products are priced at the high end of software used by a wide range of businesses, says flatly, "The reality is, people are paying for what they get."

Conversely, Bricklin, the designer of VisiCalc, says Kahn "showed that some products are completely mispriced." But asked if such best-sellers as dBase III and Lotus 1-2-3 are worth their \$500 or \$600 list prices, he says: "Yes. And so is Turbo Pascal: for certain users."

Bricklin argues that most users have one "main productivity program you sit with" all day long. "The main productivity program you're using, apparently, is going in the \$300 to \$800 range." For people who write computer software for a living, Turbo Pascal might be that program; for people who run a business off their computer, 1-2-3 might be that program. (In the early days of personal computing, customers would walk into computer retailers and, rather than ask for an Apple computer and Bricklin's program, would say, "I want to buy one of those VisiCalc machines." That's an

Borland helped force open the RAM-resident window with the pop-up concept employed in SideKick. The roaring success of the program has had a profound effect on how many other software makers design and execute RAM-resident programs.

extreme case, but the same idea.)

For his part, Bricklin, who is now president of Software Garden, Inc., in Newton, Mass., says the pricing of his most current product—Dan Bricklin's Demo Program, intended for software developers—is a direct result of the principles of pricing that Kahn established earlier. "I'm selling a product that most people (in the industry) feel should cost \$250, and I'm selling it for \$75," he says. "We felt it was the right price. There's a price people will pay even if they're not sure they're going to use the program, and that price is apparently less than \$100. And Philippe has gone for that."

Morton Rosenfeld's firm, Corporate Software, Inc., in Canton, Mass., was the first mail order retail business for large corporate purchases of software. "There's nothing magic in pricing," he states. "Some products are worth \$99 to a lot of people; other products are worth \$495 to a lot of people; and other products are worth \$495 to a few people. It's a question of pricing at a point where a customer gets value."

Obviously, a lot of customers believe there is value in Borland products—over 3 million packages have been sold. And though 1 million of those are SideKick and another half-million are Turbo Pascal, "the company is very unusual," says Morrow. "You see, Philippe doesn't have a single product that's responsible by itself for his company. Every other software company, except Microsoft, has one product—or one-and-one-half products, if you will—that provides the bulk of their income." Morrow says the integrated packages—Lotus's Symphony and Ashton-Tate's Framework—are, in combination with their original 1-2-3

and dBase programs, respectively, the "one-and-one-half" products of those two leaders.

"If you look at Borland, I think you'll find they have a wide variety of products, which are doing reasonably well," he concludes. "Their income is distributed through a dozen products now."

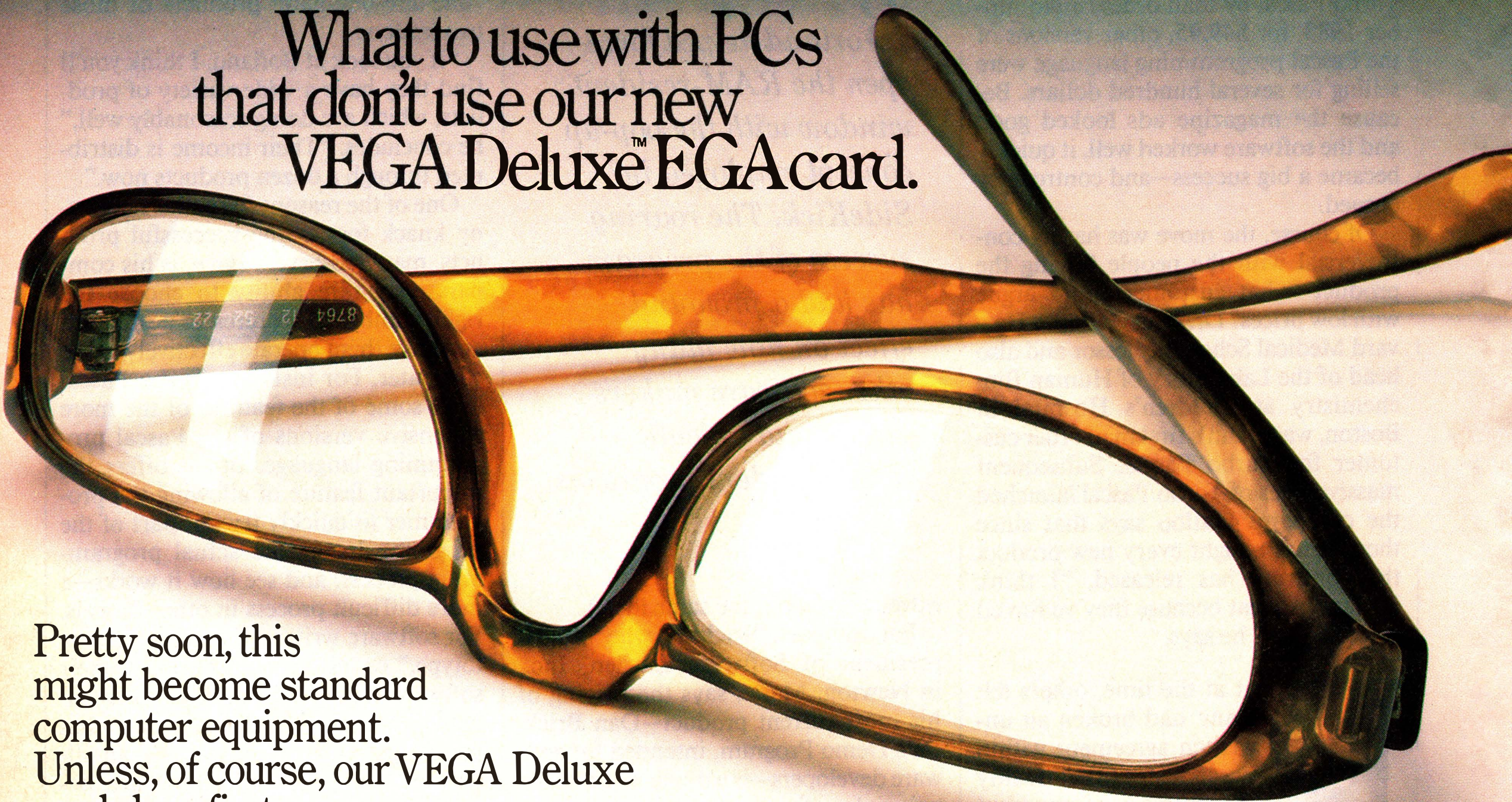
One of the reasons for Kahn's uncanny knack for issuing successful products, many observers agree, is his comparatively rare ability to choose the right number of features in a program and have them operate effectively in the computer. For instance, Turbo Pascal lacks some of the features of the more expensive versions of the Pascal programming language. But it offers the important feature of allowing the programmer to quickly try out part of the program, during the actual programming process, and see how it works—a more difficult process in other Pascals. For software writers who need to "prototype," or test-drive, portions of their software as they write it, this is an invaluable feature. "Understanding what people get out of software is an ill-defined and little-understood art, because it has such a short history," says observer Alsop. "Philippe is very good at that."

Another reason for his success is his pioneering ability to create new ways of doing things. The pop-up concept of RAM-resident software—popularized, though not invented, by Kahn—has affected the design of many other programs. It has pervaded the industry to the extent that some software companies, such as Living Videotext, producer of ThinkTank and Ready, produce and sell two versions of their program—one memory-resident, and one not.

What goes through Kahn's mind when he's working on a new product? He readily admits that he does not write all of the program code in each new product—"I write, but I'm a designer. I'm not the kind of guy who is going to write 100 percent of a product himself"—but he does have a deep enough knowledge of programming "to know what's going to work and what's not going to work, technically."

When designing a new product, or evaluating an existing one to acquire and market it (as he did with Reflex, a data base program), "I look at it as a user," he says. He asks basic questions: "Will I use this? Does it make sense?"

What to use with PCs that don't use our new VEGA Deluxe™ EGA card.



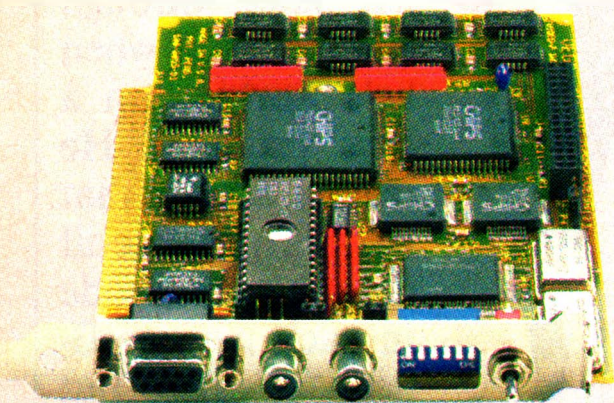
Pretty soon, this might become standard computer equipment. Unless, of course, our VEGA Deluxe card does first.

And that's a distinct possibility. After all, this short-card video adapter offers 37% higher screen resolution than standard EGA cards.

Visualize it: your existing software sharper and clearer by more than a third. Programs like Lotus 1-2-3 and Symphony, with 132 columns and 43 lines. Microsoft Windows in 640 x 480, too. And AutoCAD. As well as EASYCAD, EGA Paint, GEM, Dr. Halo II, In·A·Vision, Windows Draw, Windows Graph, and much more.

In fact, with all this information on the screen, there's only one thing there's less of. Strain on your eyes.

That's because the VEGA Deluxe gives you both 640 x 480 *and* 752 x 410 resolution. (Of course, for more than 640 x 350, the VEGA Deluxe requires a Multisync® or equivalent.)



The VEGA Deluxe is also compatible with every other video standard: EGA, CGA, Hercules and MDA. And when used with a compatible monitor, it automatically selects which mode is right for your software's needs.

At Video Seven, we've sold over 200,000 EGA cards to people who've seen the difference. If you'd like to see the difference for yourself, just call 1-800-238-0101 for the name of the Video Seven dealer nearest you. (In California, call 1-800-962-5700.)

The VEGA Deluxe. It puts everything in proper focus.

Video Seven Inc., 550 Sycamore Drive,
Milpitas, CA 95035.

VIDEO SEVEN
We make a clear difference.

High resolution modes require TTL color monitors capable of 25 KHZ and 29.4 KHZ. Trademarks: VEGA Deluxe—Video Seven Inc., Hercules—Hercules Computer Technology, MultiSync—NEC Home Electronics (USA) Inc., EASYCAD—Evolution Computing, EGA Paint—Rix SoftWorks Inc., GEM—Digital Research Corp., Dr. Halo—Media Cybernetics, In·A·Vision, Windows Draw, Windows Graph—Micrografx Inc.; Registered trademarks: Video Seven—Video Seven Inc., Lotus 1-2-3, Symphony—Lotus Development Corp., Microsoft—Microsoft Corp. Video Seven reserves the right to change specifications without notice.

(For More Information Circle 58)

He points at his original SideKick to explain the logic behind the product. "Imagine I'm in the notepad," he says, "and I want to get to the calculator. If I know SideKick well, I'll type Alt-C to get to the calculator. But if I don't remember how to get to the calculator, then I will leave my finger on the Alt key, and after a few seconds, the pop-up menu pops up. Then I can get to the calculator using the scroll bar."

That's an example of what Kahn calls a "two-level user interface," which is, in the jargon of the industry, "intuitive." He explains one of his main rules for product design, which has won him both high sales figures and imitation by other software designers: "Even if I don't have an instruction manual, I've got to be able to figure it out. Things have got to be logically organized."

This is the sober, well-behaved side of Kahn—logic and order—coming into play. "Compare a program to a filing cabinet," he says. "Some programs, they have all the ideas, and everything you want to do with them, you can. But everything is just tossed into the filing cabinet with no order."

"And what I like," he explains, "is to have everything perfectly filed in its place, so when you look for something, you just find it."

For the future, Kahn will once again try to blaze a trail throughout the industry with his concept of the "soft user interface"—a feature of an as-yet-unnamed business product to be released this year. "Instead of telling the user how we want him to use a software product," he says, "we'll make the software product's user interface flexible enough so that the user can modify it or make it suit his own needs." For example, if you want to use the F1 key for help, you can specify that; if you prefer to use the F1 key for exiting the program, you can change the program yourself to make it do that.

Borland is gradually gravitating toward the Apple Macintosh as a new market for its software. Already, there are three products: Turbo Pascal, Reflex, and SideKick, for the Mac. The company is attempting to woo users with improved Macintosh versions of its existing line of MS-DOS products—improved to have more features than their MS-DOS counterparts, and having the more visual interface which is part and parcel of the Mac. For example, the new SideKick for the Mac, release 2, incorporates a spreadsheet pro-

The material rewards of success now include a company-owned Porsche 928, a house with a hot tub, and a sailboat. Kahn also helped to bankroll the recent unsuccessful America's Cup bid by the Heart of America yacht-racing syndicate.

gram with graphics and an outlining program.

Kahn says, "A heck of a lot of people have an interest in the Mac," and promotes the Mac Plus, with its upgrades over the original Macintosh—such as a hard disk option and increased speed—as "last year's biggest hardware achievement" because "it really affirmed an alternative to the MS-DOS world."

Kahn's unusual success with most programs has made some of his lesser accomplishments stick out like a sore thumb. His predictions in print about Turbo Lightning—a system of on-line reference products that began with a spell checking program and has not been succeeded in short order by the series of follow-on products that Kahn promised—has led to some ribbing. In one magazine, Kahn was quoted as promising he would "do whatever it takes to make Lightning the standard knowledge retrieval system." Bricklin calls the lackluster sales the "embarrassment of embarrassments." Kahn, annoyed, responds, "Yeah, it's funny that people expect complete miracles from Borland," adding, "So, we can do miracles, but only one or two a month."

He says that he still plans to do all the things he promised in the past—including putting reference works such as *Black's Dictionary of Law* and *Bartlett's Familiar Quotations* in a Lightning-and-compact disk/read-only-memory (CD-ROM) package, but he won't say when. "I'm not going to give a time frame again, because I got burned with it," he says.

By and large Philippe Kahn has been an unqualified success—largely by his own hand, and certainly on his own terms. Tim Berry, a Palo Alto, Calif.,

computer industry consultant, helped Kahn finalize the first version of his initial business plan—which, ironically, was never funded. In the beginning, users, through their purchases, provided the lion's share of Borland's operating capital, since most venture capitalists refused to invest in Kahn. Berry says "I was close enough to the beginnings to know that the real driving force behind Borland was Philippe Kahn. It was his concept that made the company. He wasn't just lucky, or using somebody else's ideas."

And now, Kahn has all the material rewards of a successful entrepreneur—a 1985 Porsche 928, which is a company car; a sailboat; a house with a hot tub; and, most important, perhaps, for him, all the computers and software he wants to play with. Borland's success also enabled it, and Kahn, to help sponsor Heart of America in the America's Cup trials. The crew, who didn't make the finals, came to Kahn's attention after calling Borland for help with Reflex.

"He's not where he expected to be," says Bricklin, "so basically, it's all found money. He's under incredible pressures, because so much is expected of him. So he might as well enjoy it."

"The goal was to be able to build quality products, and give quality service, and make a decent living at it. The goal of me starting the business was never to make millions," Kahn says.

"I think the reason we're making money is, we never really tried to. The goal was to do something I liked, and have other people associated with it," he says. "And we've been successful. I think that's the best assurance you can have for your customers and shareholders, to do things like that. Because in the long run, I think, it pays off." ■



PLUS 8% OR LESS SOFTWARE RENTALS[†]

GAMES & EDUCATIONAL SOFTWARE

(Please add \$2.50 shipping and handling for each title ordered from below.)

Broderbund <i>The Print Shop</i>	\$30.00*
Broderbund <i>The Print Shop Library, Disk 1 or 2</i>	21.00*
Broderbund <i>Toy Shop</i>	34.50*
Davidson <i>Math Blaster or Word Attack</i>	23.00*
Electronic Arts <i>Amnesia</i>	29.97*
Electronic Arts <i>Music Construction Set or One on One</i>	15.97*
Infocom <i>Hitchhikers Guide, Ballyhoo</i>	20.00*
Infocom <i>Leather Goddesses of Phobos</i>	20.00*
Infocom <i>Zork II, Zork III</i>	22.00*
Microprose <i>F-15 Strike Eagle or Silent Service</i>	18.50*
Microsoft <i>Flight Simulator Vers. 2</i>	27.00*
Mindscape <i>View to A Kill/First Blood Pt. 2/The Mist</i>	21.00*
Mouse Systems <i>PC Paint + -Turn Your PC into a Color Macintosh</i>	59.95*
Scarborough <i>MasterType</i>	19.75*
Sierra On-Line <i>Black Cauldron</i>	21.25*
Sierra On-Line <i>King's Quest II</i>	24.75*
Spectrum Holobyte <i>GATO</i>	18.00*
Spectrum Holobyte <i>Telestar Level 1, Orbitor</i>	24.00*
Spinnaker <i>Alphabet Zoo, Kinder Comp., Face Maker</i>	15.97*
Spinnaker <i>Delta Drawing or Most Amazing Thing</i>	20.75*
Springboard <i>Certificate Maker</i>	31.00*
Springboard <i>Newsroom</i>	29.97*
Springboard <i>Newsroom Pro</i>	64.50*
Sublogic <i>Night Mission Pinball</i>	20.00*
Sublogic <i>Jet</i>	27.50*

*PC NETWORK MEMBERS pay just 8% above the wholesale price, plus shipping.

†All prices reflect a 3% cash discount. Minimum shipping is \$2.50 per order.

International orders call for shipping and handling charges. Money Orders, company and personal checks please allow 10 working days to clear. All prices are subject to change without notice. All products subject to availability.

TM—Registered trademarks of Apple/Ashton-Tate/AST/Compaq/
Epson/Hayes/IBM/Intel/Lotus/Macintosh/Microsoft

CALL FOR PRICING ON APPLE PRODUCTS

PC NETWORK

Big Values on Computer Monitors

MONITORS

Amdek 310A Amber TTL Monitor	\$130.00*
Amdek Color 600 Hi Res RGB Monitor	365.00*
Amdek Color 722 Enhanced EGA Monitor	424.00*
Amdek Color 725 13" Ultra Hi Res	479.00*
Magnavox 14" Color RGB 640x240 Monitor	250.00*
Magnavox 12" TTL Amber Monitor	79.00*
Magnavox 14" EGA Monitor w/tilt	435.00*
Magnavox 14" Multi-mode	489.00*
Princeton HX-12 Color RGB Monitor	369.00*
Princeton HX-12E Hi Res RGB/EGA Monitor	445.00*
Princeton Max-12 12" Amber TTL	138.00*
Taxan 650 Hi Res RGB 720x400	470.00*
Zenith ZVM-1240 12" Amber Hi Res TTL	140.00*

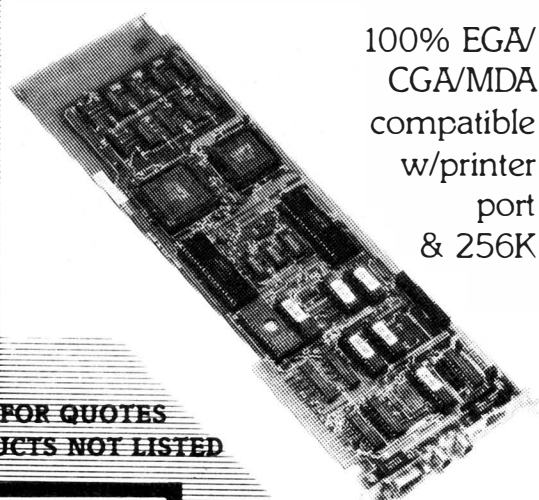


NEC Multisync Monitor

\$530.00*

Your #1 Source for Add In Boards

THE™ EGA Graphics +
\$220.00*



100% EGA/
CGA/MDA
compatible
w/printer
port
& 256K

VIDEO BOARDS

Hercules Color Card w/Parallel Port	\$135.00*
Hercules Monochrome Graphics Card	162.00*
Paradise Autoswitch EGA	336.00*
Paradise Modular Graphics Card	219.00*
Quadram Quad EGA +	323.00*
THE™ Color Card 100% IBM Compatible	60.00*
THE™ H720 Mono Graphics w/Parallel Port 100% Hercules Compatible!	69.00*

MULTIFUNCTION CARDS

AST Advantage for AT w/128K	\$325.00*
AST Six Pak Plus w/64K	139.00*
Orchid Conquest 2.5MB RAM S/P/PCnet Con/Clk	220.00*
Orchid Tiny Turbo 286	399.00*
THE™ Multi I/O I/O Plus Clone Ser/Par/Game/Clock	60.00*
THE™ Multi 384 w/OK Ser/Par/Game Clk/Cal	67.00*
THE™ 2MB RAMCard Lotus™/Intel™ Specs w/OK	99.00*

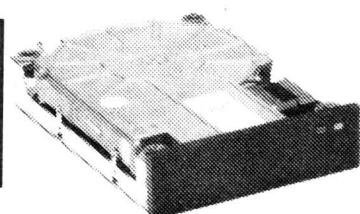
PRODUCTS MAIL ORDER COMPANY

CALL FOR QUOTES
ON PRODUCTS NOT LISTED

The Best Buys in Disk Storage

DISK DRIVES

Everex 60MB 1/2 Ht Int. Streaming Tape Backup	\$725.00*
IOmega Dual 20MB Bernoulli Box w/Cntrl	2,199.00*
IOmega Dual 10MB Bernoulli Box w/Cntrl	1,710.00*
PC Network 1/2 Ht 360K Floppy Drive	75.00*
PC Network 10MB 1/2 Ht Hard Disk Kit	289.00*
PC Network 30MB AT Internal Hard Disk	445.00*
PC Network 30MB Capacity 1/2 Ht Hard Disk w/RLL Controller	425.00*
PC Network 10MB 1/2 Ht. Int. Streaming Tape	340.00*
PC Network 20MB 1/2 Ht. Int. Streaming Tape	520.00*
Tandon 20MB Internal Discard	435.00*
TEAC 1.2MB Add On Floppy for the IBM AT	99.00*
THE™ 20MB HD/20MB Tape B/U Combo Kit	699.00*
THE™ 20MB Hard Disk Card	375.00*

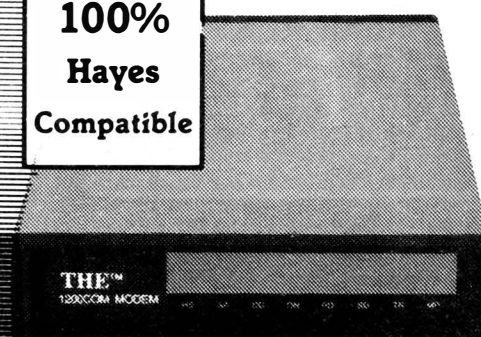


THE™ 20MB
Hard Disk Kit

w/controller, cables

\$347.00*

100%
Hayes
Compatible



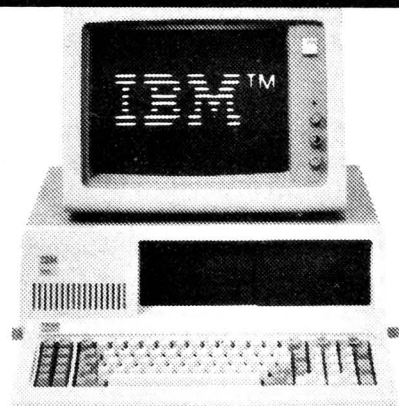
The Best Buy in Modems

THE™ 1200 COM External
1200 Baud w/auto dial, re-dial, speaker

\$119.00*

MODEMS

Anchor Lightning-1 2400 Baud 1/2 Card	\$282.00*
Anchor Lightning-1 2400 Baud External	309.00*
Hayes Smartmodem 2400 External	525.00*
Hayes Smartmodem 1200B w/Smartcom II VT-100 Emulator	315.00*
Hayes Smartmodem 2400B Internal	478.00*
Prometheus 2400 Baud Upgradable Modem	329.50*
THE™ 1200 Com Short Slot Internal Modem w/Software	109.00*
THE™ 2400 Com External 2400BPS	259.00*
THE™ 2400 Com Internal 2400BPS	197.00*
U.S. Robotics Courier 2400BPS External	345.00*
U.S. Robotics Password 1200BPS External	180.00*



IBM™ XT BASE SYSTEM

256K System/2 360K Drives/Keyboard

\$1,190.00*

IBM™ AT BASE SYSTEM

1.2 MB Floppy w/256K Hard Controller

\$2,204.00*

IBM™ XT 286 System	\$2,875.00*
IBM™ XT 20MB HD	\$1,497.00*



COMPAQ™ PORTABLE

20MB Hard Disk/360K Drive/256K RAM

\$1,800.00*

COMPAQ™ DESKPRO SYSTEM

256K CPU/1 Floppy/Hard Disk

\$1,825.00*

AT&T 6300 PC CPU2/640K, 2 Floppy 1 Ser/1 Par, Mono Monitor, MS DOS, Keyboard	\$1,640.00*
---	--------------------

DS/DD
DISKETTES
5 1/4"

BOX OF 50

44*
ea.

BOX OF 10

\$7.95*

• NEWSLETTERS • 24 HOUR BULLETIN BOARD • SOFTWARE RENTALS

(Catalog Price Updates and Reviews)

(10,000 Free Programs to Download)

(Over 1,000 Titles in our Library)

IBM® PC/XT COMPATIBLE

PROFESSIONAL SYSTEM **699.95**

- PC/XT compatible 4.77 MHz 8 expansion I/O motherboard
- 640 K RAM Memory on board
- 360 K 1/2 HT. floppy drive
- Floppy disk Controller card
- Monochrom graphic card w/parallel printer port
- 12" high resolution monochrom monitor
- 135W power supply
- PC/XT style keyboard
- Metal case with speaker

- * F. C. C. APPROVED
- * FULLY ASSEMBLED
- * 100% BURN-IN/ TESTED
- * 1 YEAR LIMITED WARRANTY

OPTIONAL:

20 MB Hard Disk w/W.D. Controller 415.00
Extra 360K Drive 80.00

PRINTER

Panasonic
KX-P1080 215.00
KX-P1080i 255.00

RITEMAN
RITEMAN PLUS 190.00
RITEMAN 15 450.00
ELECTRONIC DAISY WHEEL PRINTER 245.00
PRINTER CABLE 6' 10.00
PRINTER CABLE 12' 24.00
PRINTER CABLE 24' 38.00

MONITORS

12" SAMSUNG TTL (GRN) 69.00
12" SAMSUNG TTL (AMB) 75.00
12" SAMSUNG TTL (AMB) SWIVEL/TILT FLAT TUBE 98.00
13" COLOR RGB 285.00

ADD ON BOARDS

□ Multifunction board with Drive Controller Board, Serial, Parallel, Game Port. \$85.00
□ HAYES Compatible 1200 Full Card \$139.00

KEYBOARDS

MAXI Switch AT/XT \$69.00

COLOR SYSTEM **899.95**

- PC/XT compatible 4.77 MHz 8 Expansion I/O Motherboard
- 640 K RAM Memory on board
- 360 K 1/2 HT. floppy drive
- Floppy disk Controller card
- Color graphic card/ RGB and composite output
- 13" high resolution RGB color Monitor
- 135W power supply
- PC/XT style keyboard
- Metal case with speaker

TO ORDER 1-213-327-9300

No C.O.D. No open account. Only prepaid or Credit card orders.
Add 8% shipping and handling fee. California residents add 6 1/2% Sales Tax.



ROMANICUS CORPORATION

1539 W. 139th St. Gardena, CA 90249
9:00 am — 5:00 pm. Monday — Friday



IBM® is a registered trademark of int's Bus Machines Corp.

USED COMPUTERS

**Buy from the FIRST in the Nation
Buy from the BEST in Experience**

CALL FOR THE
LOWEST PRICES ON:

**APPLE IIE/IIC
MACINTOSH
IBM/COMPAQ
EPSON
DIABLO
KAYPRO
AND MORE!**

*"The oldest
used computer
store in the
United States
...buyers have
found as much
user support
as could be
expected at
any retail
computer
store."*

*Personal Computing
April '86*

**MAR.
SPECIAL**



Complete Apple II+ System \$395.00

BUY • SELL • TRADE

90 Day parts & labor warranty

1415 El Camino Real
Mtn. View, CA 94040
(415) 968-6811

icb
INTERSTATE COMPUTER BANK

UNITED STATES BANKRUPTCY COURT DISTRICT OF MASSACHUSETTS

In re)
SUPPRESSION DEVICES CORP. f/k/a) No. 84-681-JG
ELECTRONIC PROTECTION DEVICES,) (Chapter 11)
INC.,)
Debtor)

NOTICE OF ORDER ESTABLISHING BAR DATES FOR WARRANTY CLAIMS

PLEASE TAKE NOTICE that an Order Barring Warranty Claims and Providing for Notice of Same has been entered and pursuant to said Order:

1. That, except as otherwise specifically provided in this Notice, any and all claims by any person or entity ("Claimant") against Debtor (i) arising from any warranty express or implied of products sold by Debtor to anyone prior to February 20, 1985 ("Debtor's Products"), and (ii) regardless of when or whether Claimant purchased the given item of Debtor's Products directly from Debtor or from some other vendor (the "Warranty Claims"), are forever barred and may not be the subject of any action in this or any other forum.

2. That Claimant may select either Option A or Option B below (but not both), and selection of one Option shall operate as an irrevocable bar to invocation of the other Option:

OPTION A

If Claimant wishes to preserve whatever rights it may have to obtain any one or more of the following remedies (the "Normal Course Remedies"): (i) repair; (ii) replacement; (iii) payment or other value (as by repair of computer equipment damaged by failure of Debtor's Products) of up to a maximum amount of \$2,500 for each Warranty Claim under Debtor's performance warranty, Claimant must deliver written notice of its Warranty Claim with proof of actual damages to Electronic Protection Devices, Inc., a Delaware corporation, 35 Dunham Road, Billerica, Massachusetts 01821 ("EPD-Del"), so that such written notice and proof are received by EPD-Del at the foregoing address before 5:00 p.m., EDT, June 30, 1987.

OPTION B

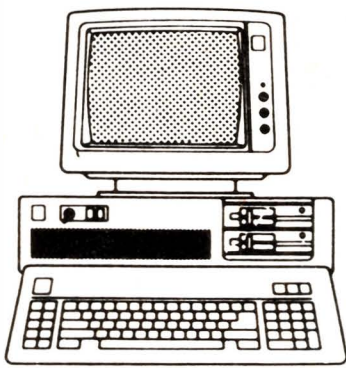
If Claimant wishes to preserve whatever rights it may have to obtain any form of relief other than the Normal Course Remedies specified in Option A, Claimant must file a proof of claim against the Debtor before 5:00 p.m., EDT, April 15, 1987 with Clerk, United States Bankruptcy Court, 1101 Boston Federal Office Building, 10 Causeway Street, Boston, MA 02222-1704.

3. That nothing in this Notice shall be deemed to constitute EPD-Del as, or to imply that EPD-Del is, a successor to the Debtor generally responsible for Debtor's liabilities. EPD-Del is hereby assuming no debts, liabilities or other obligations of Debtor other than Warranty Claims seeking the Normal Course Remedies set out in Option A above.

Debtor estimates that on or before March 31, 1985, end users had purchased more than 95 percent of Debtor's Products (which are not to be confused with those products that have been sold or are being sold now by the Delaware corporation known as Electronic Protection Devices, Inc., and referred to herein as EPD-Del). Any purchaser who believes he purchased one of Debtor's Products and may thereby be affected by said Order is urged to respond to this Notice regardless of the date of his purchase. For further information, call or write Debtor's attorney, Peter Nils Baylor, Esq., Nutter, McClennen & Fish, 600 Atlantic Avenue, Boston, MA 02210, phone (617) 973-9700.

COMPUTER DISCOUNT WAREHOUSE

IBM®



IBM XT SPECIAL
w/256 K 1 DRIVE\$1265.90
w/1 FLOPPY, 256K, 30 MEG\$1775.43

IBM PC™
w/1 FLOPPY, 64K\$ 969.40
w/2 FLOPPIES 64K\$1020.99
w/1 FLOPPY, 64K, 20 MEG\$1418.99

Monitors and monitor adaptor card additional
TM—Registered trademarks of IBM and COMPAQ

WHY PAY RETAIL?

Nobody Sells For Less



COMPAQ™ PORTABLE

2 DRIVE 256K\$1543.69
1 DRIVE + 1 20 MEG\$1999.99
PORTABLE II MODEL II\$2523.69
PORTABLE II MODEL IV\$3499.50

286s • PORTABLE II • DESK PROs
ALL IN STOCK

CALL FOR LOWEST CUSTOM QUOTES

TM-Registered trademark of IBM and COMPAQ

HARDWARE, SOFTWARE & PERIPHERALS AT DISCOUNT PRICES

COMPUTERS

AT&T SPECIALS

AT&T 6300 w/128K 1 drive\$1699.81
AT&T 6300 w/256K 2 drives1849.24
AT&T 6300 w/256K 1 floppy, 20 meg2174.23

All AT&Ts include monitor,
keyboard and DOS

ZENITH SPECIALS

ZS-158 1 drive 256K 5 slots w/DOS\$1263.60
ZS-171 Laptop 2 drives 256K 15 lbs1684.80
ZS-181 Laptop two 3 1/2" floppiesSAVE
ZS-241 512K 1.2 meg floppy, AT Compat.2457.00

TOSHIBA SPECIALS

TOSHIBA 1100 Plus\$1789.85
TOSHIBA 31003395.60

SHARP SPECIAL

2 Drive Portable (IBM PC Compatible)IN STOCK

WYSE PC/AT SPECIALS

WYSE PC 1 drive\$849.68
WYSE PC 1 drive 40 meg1672.70
WYSE AT Compatible 640K1749.77
WYSE AT Compatible 640K 20 meg hard2097.65

COMPAQ™ SPECIALS

COMPAQ portable w/256K 2 floppies\$1543.69
COMPAQ portable w/256K, 20 meg1999.99
COMPAQ DeskPro w/128K 1 floppy1509.96
COMPAQ DeskPro w/256K 2 floppies1674.26
COMPAQ DeskPro w/640K 20 meg hard drive 1961.96
COMPAQ DeskPro w/640K 30 meg2189.50
COMPAQ Portable II Model II2523.69
COMPAQ Portable II Model IV3499.50
COMPAQ "286" DeskPro, 256K 1 floppy 2150.60
COMPAQ "286" DeskPro w/30 meg2995.30
COMPAQ "286" DeskPro w/30 meg
512K tape3578.60
COMPAQ "286" Portable 640K, 20M3860.30
COMPAQ "386" DeskPro 40 Meg4679.28
COMPAQ "386" DeskPro 70, 130 MegSAVE

IBM PC/XT™ SPECIALS

IBM PC w/64K 1 drive\$969.40
IBM PC w/64K 2 drives1020.99
IBM PC w/64K 1 floppy 1 20 meg hard 1418.99
IBM XT w/256K 1 drive1265.90
IBM XT w/256K 2 drives1398.90
IBM XT w/256K 1 floppy and 20 meg1669.10
IBM XT w/256K 1 floppy and 30 meg1775.43
IBM XT Model 286 1 floppy and 20 meg IN STOCK

IBM AT™ SPECIALS

IBM AT w/256K 1.2 meg floppy\$2199.40
IBM AT w/512K 30 meg hard drive2989.64
IBM AT w/512K 40 meg hard drive3098.55
IBM AT w/512K 70 meg hard drive3596.50
IBM AT Model 3394077.40

Other Computers Available Upon Request

TERMINALS

KIMTRON

14" Green or Amber w/AT keyboard\$449.07

WYSE

WY-30 14" emulates ADDS and Televideo\$289.10
WY-50 14" Green emulates ADDS, Hazeltine
and Televideo429.44

DRIVES FOR ATs & 286s

MINISCRIBE 40 meg 28ms\$695.77
PRIAM 40 meg hard disk749.55
PRIAM 60 meg hard disk947.95
PRIAM 130 meg hard disk2240.40
SEAGATE 4038 30 meg hard disk559.80
SEAGATE 4051 40 meg hard disk659.80
SEAGATE 4096 80 meg hard disk985.80
360K floppy drive110.12

PRINTERS

CITIZEN 120D\$184.05
CITIZEN MSP10275.20
CITIZEN MSP20334.92
EPSON LX 86 80 Col 100 CPS NLQ STD229.61
EPSON EX 1000648.60
EPSON EX 800449.10
EPSON FX 86379.74
EPSON FX 286479.10
EPSON FX 286E539.15
EPSON LQ 800499.22
EPSON LQ 1000699.55
EPSON LQ 25001018.44
EPSON COMREX 420i 132 Col. 420 CPS 749.89

SPECIAL—LIMITED QUANTITIES

EPSON LQ 1500 with Tractor749.00

IBM Pro Printer429.40
IBM Pro Printer XL542.67
NEC Color P6/Color P7539.74 / 709.12
NEC elf 350387.66
NEC P6 80 col449.22
NEC P7 136 col 216 cps615.35
NEC P5 136 col 290 cps999.67
NEC P5XL1027.52
NEC 3550 Spinwriter797.12
NEC 8850 Spinwriter1127.65
OKI okimate 20117.72
OKI ML 182234.50
OKI ML 192 Plus344.80
OKI ML 193 Plus519.40
OKI ML 292 Plus424.44
OKI ML 293 Plus547.55
TOSHIBA P321463.25
TOSHIBA P341558.88
TOSHIBA P351 S/P899.93
TOSHIBA P351 S/P Model 2999.99

LASER PRINTERS

CORONA Laser Printer\$2099.90
H-P Laser Jet PrinterSAVE
H-P Laser Jet PlusIN STOCK
H-P Laser Jet 500 PlusNEW MODEL
QUAD Laser LS11003419.52

PLOTTERS

HEWLETT PACKARD HP7440ASAVE
HEWLETT PACKARD HP7475AIN STOCK
HOUSTON INSTRUMENTS DMP-422355.93
HOUSTON INSTRUMENTS DMP-523356.93
HOUSTON INSTRUMENTS DMP-52MP3787.70
HOUSTON INSTRUMENTS DMP-564288.43

FLOPPIES, DRIVES & TAPES

1/2 height drive\$94.00
IBM Logo Full Height Drive109.73
SEAGATE 20 meg 1/2 height hard drive 369.00
SEAGATE 30 meg full height w/controller 659.50
SEAGATE 30 meg 1/2 height w/RLL429.72
GENOA 20 meg internal tape574.85
GENOA 20 meg external tape636.02
GENOA 60 meg internal tape734.60
GENOA 60 meg external tape895.10
IOMEGA BERNOULLI 10+101798.40
IOMEGA BERNOULLI 20+202198.10
IRWIN 10 meg tape backup349.34
IRWIN 20 M & 40 M Internal TapeSAVE

DRIVE CARDS

MOUNTAIN 20 meg/30 meg\$488.60 / 559.12
MAYNARD 20 meg575.40
WESTERN DIGITAL 10 and 20 megCALL
Plus Other Drive Cards Available

MODEMS, COMMUNICATIONS & EMULATIONS

AST 5251-11 Plus\$639.04
AST 5251-12508.60
EVEREX 1200B114.90
EVEREX 2400B219.50
HAYES Tranet 1000, 128K274.10
HAYES 1200392.08
HAYES 1200B299.03
HAYES 2400575.00
HAYES 2400B489.16
IRMA 5250 (Smartalec)564.84
IRMA 3278/79 Courier734.60
US ROBOTICS All ModelsSAVE
VEN-TEL All ModelsSAVE

MONOCHROME MONITORS

AMDEK 310A\$139.99
COMPAQ monochrome monitor
(green or amber)188.46
IBM monochrome monitor219.84
PGS MAX 12E amber color167.40
PACKARD BELL Green or Amber89.95
TAXAN 123 Green119.50
TAXAN 124 Amber124.05

MONITOR INTERFACE CARDS

PACKARD BELL color card w/p\$ 99.00
PACKARD BELL monographics card w/p99.00
GENOA Spectrum (color monographic w/p) 168.75
HERCULES color card w/p144.16
HERCULES monographics plus w/p179.84
STB CHAUFFEUR HT w/p199.60

COLOR GRAPHIC MONITORS

AMDEK color 600 (Hi-Res RGB)\$399.97
AMDEK color 722488.78
IBM color monitor528.77
MAGNAVOX 14" RGB 640 x 200289.00
PGS HX-12 Hi-Resolution RGB412.32
TAXAN 635, 650SAVE
TAXAN 720386.24

ENHANCED GRAPHICS MONITORS

COMPAQ enhanced graphics monitorSAVE
IBM enhanced graphics monitor679.41
PGS HX-12E Hi-Resolution RGB488.32
TAXAN 760 New EGA Model499.00
NEC Multisync589.04
NEC APC-IV Color Monitor575.50

ENHANCED GRAPHICS ADAPTER CARDS

GENOA Spectra EGA 256K w/p294.60
PARADISE Auto Switch EGA370.70
QUADRAM EGA Card319.10
ORCHID EGA Card329.94
IBM Enhanced Graphics Adapter398.98
VIDEO 7 Vega Deluxe369.70
NEC GB-1 640x480396.41

INTERFACE CARDS & MULTI-FUNCTION CARDS

APPARAT 64/384K w/Clock\$99.89
AST 6 pack with 64K C/S/P expands to 384K 166.24
AST Premium 6 pack 512K364.25
AST Premium Advantage for AT448.48
AST Advantage for AT expands to 3 meg 345.00
INTEL PC Above Board for w/64K249.60
INTEL PC Above Board with par. & ser.279.60
INTEL AT Above Board for w/128K360.24
INTEL AT Above Board with par. & ser.398.60
JRAM-3 w/256K (Lotus 2.0 and
Symphony compatible)360.24
ORCHID Tiny Turbo399.45
QUAD AT expands to 2 Meg325.43
QUADRAM Silver Quad expands to 384K
1 par., 2 ser., 1 game, clock w/OK119.60

CHIPS

4164 (64K) 9 chip set\$9.98
128K piggy backs for AT4.94
Nine Chip Set (complete set)34.50
8087-2 (for COMPAQ DeskPro)149.33
8087-3 (for PC/XT/COMPAQ portable)121.50
80287-6 (for AT and AT Compatible)168.30
80287-8297.55
80287-10336.25
41256K (256K chips)4.00
Nine Chip Set (complete set)28.12

MISC. & ACCESSORIES

A-B Switching Box (par. or serial)\$45.00
BASF D/S, D/D12.50
BASF 3.5" Disk for MACINTOSH 10 pack19.99
BASF Disks for AT (1.2 meg)26.14
KENSINGTON Masterpiece99.99
KENSINGTON Masterpiece Plus118.40
KEYTRONICS 515099.00
KEYTRONICS 5151 PC or AT&T162.00
PERMA POWER 6 Outlet Surge Suppressor 32.95
QUADRAM Micro Fazers140.40
IBM 6 Foot Printer Cable19.99
XT Power Supply 150 Watt79.40

MICE

LOGITECH Logimouse Bus Version109.06
LOGITECH Logimouse C789.95
MICROSOFT Mouse (Bus Version)119.34
MICROSOFT Mouse (Serial Version)131.26
MOUSE SYSTEMS w/PC Paint128.87
SUMMAGRAPHS Summa Mouse w/Pad94.72
TORRINGTON Manager Mouse98.67

**MOST ORDERS SHIPPED
WITHIN 48 HOURS.**

**Call CDW for custom quotes
on products not listed.**

**If you find a better price
call us before you buy.**

WHY WAIT? CALL COMPUTER DISCOUNT WAREHOUSE NOW!

**SPECIAL
LOTUS 123
\$299.00**

1-(800) 233-4426

**HIGH VOLUME
BIDS INVITED
P.O. BOX 3048
Northbrook, IL
60065**

On all orders under \$200.00 please add \$5.00 handling fee. All prices reflect 3% discount for cash. Allow 10 business days for shipping when paying by personal check. Software, chips and other electronic components are not returnable. Non-defective returns are subject to a restocking charge. All pricing subject to change.

In Illinois
(312) 498-1426

FAX
(312) 291-1737



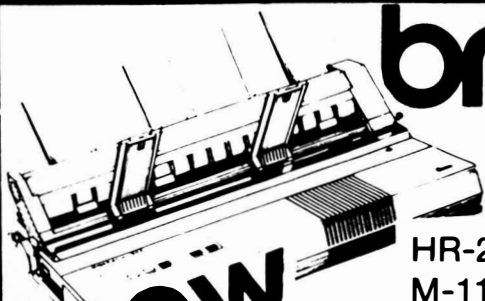
CDW 387 Per



**Super Special
Equity 1 w/Monitor
256 K Memory
20 Meg Hard Drive
\$1095**

**Epson Guaranteed
Lowest Prices**

**Super Special Includes:
EPSON EQUITY COMPUTER
360 K Floppy Drive
Tandem 20 Meg Drive
Samsung Amber or Green Monitor**



PRINTERS

**WOW
GREAT
Sale Prices!**

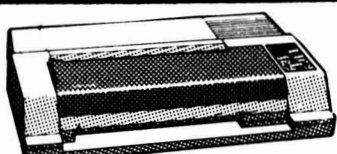
HR-20	\$399
M-1109	\$199
M-1409	Call
M-1509	Call
M-1709	Call

HARD DRIVE SPECIALS

10 Meg	20 Meg	30 Meg
\$299	\$359	\$499
w/controller & cables	w/controller & cables	w/controller & cables

CALL NOW!!!

**AT&T 6300
1 Floppy Drive
640K Memory
20 meg Hard Drive
Serial Parallel Port
Only \$1895.00**



PRINTERS

EPSON	
LX-86	\$199
FX-85	\$330
FX-86e	\$359
FX-286e	\$499
LQ-800	\$549
LQ-1000	\$699
EX-800	\$499
EX-1000	\$599

PANASONIC	
KXP 1080 I	\$229
KXP 1091 I	\$259

MONITORS

Sony-Color-RGB	
KV-1310	\$349
KV1311CR	\$399
CR-1201	\$429

Samsung	
Amber TTL 12	\$89
Green TTL 12	\$85
Green Composite	\$79
Amber Composite	\$79

Mitsuba	
510A TTL Amber	\$99
w/Tilt & Swivel Stand	

Amdek	
300A	\$119
310A	\$139
Teknika	
RGB Color	\$249

EVEREX PRODUCTS

Edge Card	\$229
Mini Magic Memory	\$ 99
20 Meg Tape Drive w/ Software	\$499
65 Meg Tape	\$699

COMPUTERS (IBM Compatibles)

	BASE	MONO	COLOR
IDS PC-XT 8088	\$499	\$629	\$729
IDS Turbo 8 Mghz w/ 2 Drives MS-Dos	\$599	\$799	\$899

Computers International
We warranty what we sell.
Master card, Visa accepted.
No surcharge C.O.D.
Require 10% deposit on
credit card. 20% restocking
fee on return merchandise.

In Chicago Call
600 W. Van Buren, Suite 502
Chicago, Illinois 60607
Tel # (312) 235-1272
1-800-237-3762 Ext. 889

*Best Prices
Best Service*

HARDWARE
COMPUTERS

PANASONIC Business & Executive Partners . . . CALL
ATARI ST COMPUTERS CALL

MODEMS, BOARDS, DRIVES

Evercom 1200 Internal	119	SixPakPlus 384K	209
Hayes Modems	CALL	SixPak Premium	249
Practical Modem 1200	135	Intel Above Board PC	225
Genoa Spectrum	185	Above Board AT	355
Hercules Graphics +	189	Talltree J-Ram 3	189
Auto Switch EGA	389	J-Ram 3AT	249
EGA Wonder	255	J-Laser +	439
Tecmar EGA Master	279	Microsoft Mach 10	265
Video 7 Vega Deluxe	379	Seagate 20MB Kit	385
384K RAM Card	85	Seagate 30MB Kit	449
Captain 384K	159	Filecard 20MB	569
Advantage Premium	439	Filecard 30MB	679
Rampage/EGA AT	759	Hardcard 20MB	679

OTHER HARDWARE

EPSON-All Models	BEST	Sweet P600	749
LX/FX/EX/LQ	PRICES	Roland DXY-880 Plotter	899
Citizen 120D	189	Houston Inst DMP-29	1799
Panasonic 1080 I	219	Amdek 722	509
Panasonic 1091 I	285	NEC 1401 Multi-Sync	639
Panasonic 1092	329	Sony KV1311 RGB/TV	CALL
Panasonic P3131	269	Sony 1302 Multi-Sync	CALL
Summasketch 1201	379	Samsung TTL	89

SOFTWARE

WORD PROCESSING — ACCOUNTING —

Manuscript	339	BPI Enterprise/Mod	429
Microsoft Word 3	249	Complete Bus. Actng	159
Word Perfect 4.1	209	DAC EZ Accounting	42
PFS: First Choice	89	Open Systems V3/Mod	429
PFS: Pro Write	115	Real World	CALL
Reference Set	53	Tax Preparer	195

DATABASE

dBase III Plus	399	Lotus/Symphony	CALL
Rapid File	259	HAL	103
Paradox	449	Framework II	399
Powerbase	199	Open Access II	289
R Base System V	349	Ability	61
Reflex	83	Mosaic Twin	57
Revelation	529	PFS: Pro Plan	145
PFS: Pro File	145		
Q & A	239		

GRAPHICS

ClickArt Pers. Publisher	109	Alice Pascal	59
Harvard Pro Publisher	399	Microsoft C	269
First Impression	389	Quick Basic	60
Chartmaster	219	Turbo Pascal Ver 3	59
Fantasy	43	Turbo Prolog	59
Freelance Plus	339	Desquiv	59
Harvard Pres. Graphics	229	Windows	59
Generic Cad	69	Carbon Copy	117
In "A" Vision	255	Fastback	95
Newsroom Pro	79	Norton Utilities	55
Printmaster Plus	36	Pop-Up Deskset	43
ProDesign II	169	HOT	45
Show Partner	48	Disk Optimizer	32
Dr. Halo II w/Mouse	109	SQZ	56
		Xtree	31
		Statgraphics	449
		Total Project Manager	289

UTILITIES

800-662-2686 orders only
for Ca. Orders, Tech Support, **415-668-9350**
Call or Write for Free Catalog

PAYMENT: (No Fee For Credit Cards) Visa, MasterCard, Cashier's Checks, Personal Checks with 2 week hold, Qualified P.O.'s. California residents add sales tax.
SHIPPING: UPS ground-2% per order, \$5 min. FREE for SW orders over \$1000. UPS Blue-3% per order, \$7 min. FREE for SW orders over \$1500. Printers, Monitors, Disk Drives, Computers — Call for charges.

All Products New with full warranties.
Price & availability subject to change without notice.



584 CASTRO ST., SUITE 487 SAN FRANCISCO, CA 94114
a division of MCSS, Inc. Computer & Software specialists since 1981

Compu\$ave

CALL 1-800-624-8949

ARIZONA RESIDENTS CALL (602) 437-4855

COMPUTERS

AT&T 6300: 640K W/1 Drive	1275
Cordata PC: Port. & Desk /2 Drives	895
Cordata AT: Portable W/1.2M Drive	1599
Laser 128: Apple IIE Compatible	382
Packard Bell AT: 640K W/44m Drive	2199
Packard Bell AT: 640K W/72M Drive	2599
Panasonic Bus. Partner: 2 Drives	865
Panasonic Bus. Partner: 20M Drive	1165
Panasonic Bus. Partner 286: 30M Drive	2045
Sharp PC7000: Portable W/2 Drives	985
Sperry IT: 1M W/44M Drive	2799
Toshiba T1100 + & T3100 Portables	CALL
Wyse 286: 10MHz W/640K & 1.2M Drive	1765
Wyse 286: 10MHz W/640K & 20M Drive	2145
Wyse 286: 10MHz W/640K & 40M Drive	2695
Wyse Plus Turbo: 640K W/20M Drive	1475
Wyse Plus Turbo: 640K W/2 Drives	1019
Zenith 181: Portable W/2 Drives	CALL
Altos/Corvus/ITT/NEC/Televideo	CALL

DISK DRIVES

Seagate 20M Kit	369	Apple Drives	112
Seagate 30M Kit	412	Toshiba 3" 5"	119
Alloy/CDC/I OMEGA/Maynard/Mountain	CALL		
Priam/Tandon/Tallgrass/Teac/Tecmar	CALL		

PLOTTERS

Houston 41/42	2325	Hewlett 7475	1575
Houston 51/52	3295	Hewlett 7570	4449
Houston 51/52MP	3695	Ioline 4000	4295
Houston 56A	4195	Roland 880	879
Roland 800	CALL	Roland 980	1165
Calcomp/Gould/Taxan/Other Models	CALL		

DIGITIZERS

Calcomp 12 x 18	895	Kurta Penmouse	185
Hitachi 11 x 11	585	Kurta 12 x 17	559
Houston TG1011	499	Summa 12 x 12	379
Houston TG1017	595	Summa 12 x 18	675
MS BUS Mouse	109	Mouse Systems	122
GTCO & Other Models & Mice	CALL		

MONITORS

Amdek 410	158	EGA Wonder	272
Mitsubishi 8918	2875	Arist 10	2145
NEC Multisynch	555	NEC GB-1	385
Sony Multiscan	CALL	Vega Deluxe	359
Thomson 450A	165	Chaufeur HT	185
Wyse 700 W/Card	699	Taxan Gold	319
Taxan 760: 14" EGA & 560 Auto. Card	659		

BOARDS

MODEMS

Ven-Tel 2400+	372	AT&T 4024	472
Promodem 1200B	125	Hayes 1200	365
Promodem 2400G	255	Zoom 1200ST	185
Anchor/Racal-Vadic/UDS/US Robotics	CALL		

PRINTERS

Citizen 120D	175	Alps P2000	699
CIE LIPS 10	2345	Canon Laser	1935
Diconix 150	329	Genicom 5010	2365
Panasonic 1080i	195	NEC P6	428
Panasonic 1091i	258	NEC P7	599
Panasonic 1595	565	NEC CP6	539
Fujitsu/Okidata/Star/TV/Toshiba/Others	CALL		

TERMINALS

Adds Viewpoint +	439	Wyse 30	289
Televideo 905	285	Wyse 50	369
Televideo 955	399	Wyse 60	408
Televideo 9220	452	Wyse 85	432

HOURS: MON-FRI 7AM TO 6PM

Saturday: 9am to 2pm Closed Sunday
Address: 4207 S. 37th St., Phoenix, AZ 85040
Prices Reflect Cash Discounts And Subject To
Change Without Notice. We Cannot Guarantee
Compatibility. Major Credit Cards & Selected
PO's Accepted. A Division of Adlanko Corp.

COMPUTER DISCOUNT WAREHOUSE

**OVER TWO
MILLION DOLLAR
INVENTORY**

**NEC Products
in Stock for
Immediate Shipment**

WHY PAY RETAIL?

*Nobody Sells
NEC For Less*



NEC Multisync

The Intelligent Monitor
CGA, EGA, Professional Graphics and Hercules Com-
patible 800 by 560 resolution. Autoscan frequencies
between 15.5 and 35 kHz. TTL and Analog Inputs.
Text switch with choice
of 7 colors.

\$589.00

ALL NEC COMPUTER PRODUCTS AT LOWEST EVER **DISCOUNT** PRICES

NEC Printers: Tops in Quality and performance...

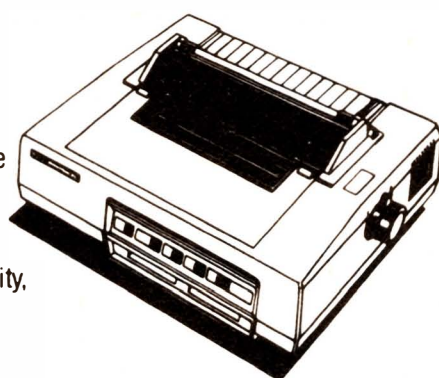
NEC's Best Selling 24 Pin Dot Matrix Printers

PINWRITER P5

- 24 Pin Dot Matrix Printer
- 240 cps Draft
- 100 cps Letter Quality
- Epson and Diablo Compatible
- 8K Buffer
- 16 Resident Fonts
- 2 Option Slots
- Front Panel Font, Letter Quality, Noise Reduction Controls
- LQ1500 Emulation

Options:

- Font and Memory Cartridges
- Bidirectional Tractor Feed
- Single and Dual Bin Sheet Feeders
- Up to 40K Buffer



- Downloadable Fonts
- Serial Interface

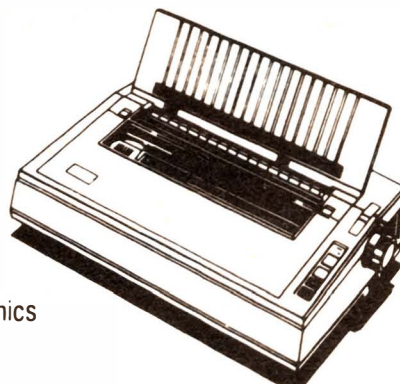
\$999.67

PINWRITER P6

- 24 Pin Dot Matrix Printer
- 216 cps Draft
- 65 cps Letter Quality
- 10 Inch Paper Width (80 Column)
- 10K Buffer (Serial)
- 20 Resident Fonts
- IBM Character Set
- 360 x 360 per inch Graphics

Options:

- Bidirectional Tractor Feed
- Single Sheet Feeder
- Serial Interface



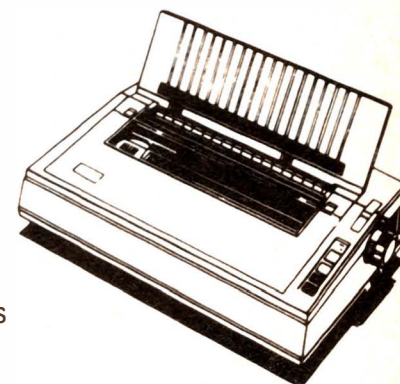
\$449.22

PINWRITER P7

- 24 Pin Dot Matrix Printer
- 216 cps Draft
- 65 cps Letter Quality
- 16 Inch Paper Width (132 Column)
- 16K Buffer (Serial)
- 20 Resident Fonts
- IBM Character Set
- 360 x 360 per inch Graphics

Options:

- Bidirectional Tractor Feed
- Single Sheet Feeder
- Serial Interface



\$615.35

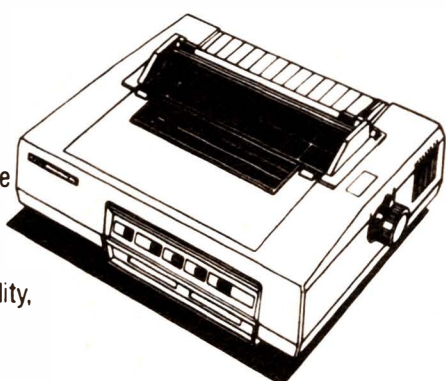
NEC's All New Line of Color Printers

PINWRITER P5

- 7 Color Printing
- 24 Pin Dot Matrix Printer
- 240 cps Draft
- 100 cps Letter Quality
- Epson and Diablo Compatible
- 8K Buffer
- 16 Resident Fonts
- 2 Option Slots
- Front Panel Font, Letter Quality, Noise Reduction Controls
- LQ1500 Emulation

Options:

- Font and Memory Cartridges
- Bidirectional Tractor Feed
- Single and Dual Bin Sheet Feeders
- Up to 40K Buffer



- Downloadable Fonts
- Serial Interface

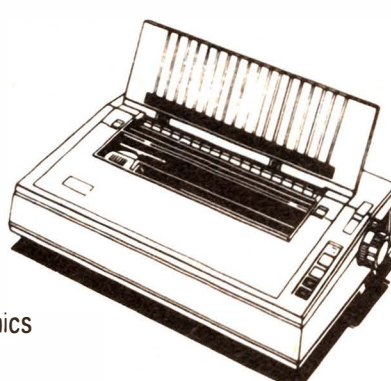
\$1,027.52

PINWRITER P6

- 7 Color Printing
- 24 Pin Dot Matrix Printer
- 216 cps Draft
- 65 cps Letter Quality
- 10 Inch Paper Width (80 Column)
- 10K Buffer (Serial)
- 20 Resident Fonts
- IBM Character Set
- 360 x 360 per inch Graphics

Options:

- Bidirectional Tractor Feed
- Single Sheet Feeder
- Serial Interface



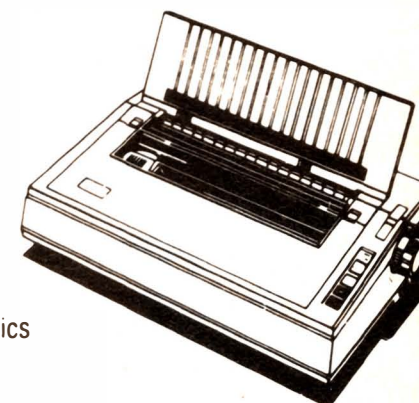
\$539.74

PINWRITER P7

- 7 Color Printing
- 24 Pin Dot Matrix Printer
- 216 cps Draft
- 65 cps Letter Quality
- 16 Inch Paper Width (132 Column)
- 16K Buffer (Serial)
- 20 Resident Fonts
- IBM Character Set
- 360 x 360 per inch Graphics

Options:

- Bidirectional Tractor Feed
- Single Sheet Feeder
- Serial Interface



\$709.12

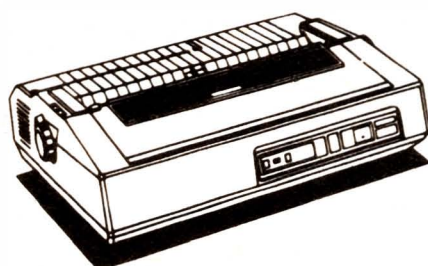
NEC's True Letter Quality Thimble Printers

SPINWRITER 8550

- Up to 128 Character Daisy-Wheel Printer
- 55 cps—12 Pitch Text
- Bidirectional Printing
- Bidirectional Paper Feed
- 13.6 Inch Line Width
- Parallel and Serial Interface

Options:

- Single and Dual Bin Sheet Feeders
- Forms Tractors
- Envelope Adapter
- 10, 12, 15 Pitch Proportional Fonts



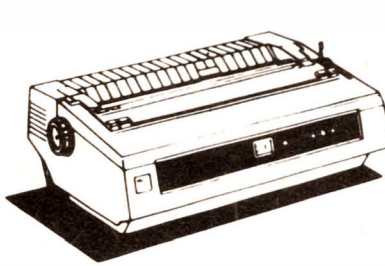
\$1,127.65

SPINWRITER 3550

- Up to 128 Character Daisy-Wheel Printer
- 30 cps—12 Pitch Text
- Bidirectional Printing
- Bidirectional Paper Feed
- 13.6 Inch Line Width
- Parallel and Serial Interface

Options:

- Single and Dual Bin Sheet Feeders
- Forms Tractors
- Envelope Adapter
- 10, 12, 15 Pitch Proportional Fonts



\$797.12

SPINWRITER e.i.f.

- Up to 128 Character Daisy-Wheel Printer
- 19 cps—12 Pitch Text
- Bidirectional Printing
- Bidirectional Paper Feed
- 11 Inch Line Width
- 3K Buffer

Options:

- Unidirectional Tractor Feed
- 10, 12, 15 Pitch Proportional Fonts



\$387.66

...at prices only Computer Discount Warehouse can offer!

(For More Information Circle 89)

**MOST ORDERS SHIPPED
WITHIN 48 HOURS.**

**Call CDW for custom quotes
on NEC Products not listed.**

**If you find a better price
call us before you buy.**

WHY WAIT? CALL COMPUTER DISCOUNT WAREHOUSE NOW!

**CDW stocks a full line
of products to
support every
computer need.**

1-(800) 233-4426

In Illinois (312) 498-1426 FAX (312) 291-1737



NEC
NEC Information Systems, Inc.
AUTHORIZED DEALER

**One Year Warranty
on all Printers**

SALE •

Famous National Brand

• SAVE

NLQ 180

Hi-Speed Printer Sale

• 160 - 180 CPS • Near Letter Quality •

Lifetime Warranty*

**Below
Wholesale
Cost Prices!!!**

\$199⁰⁰

List \$499.95

**Fantastic
Price**

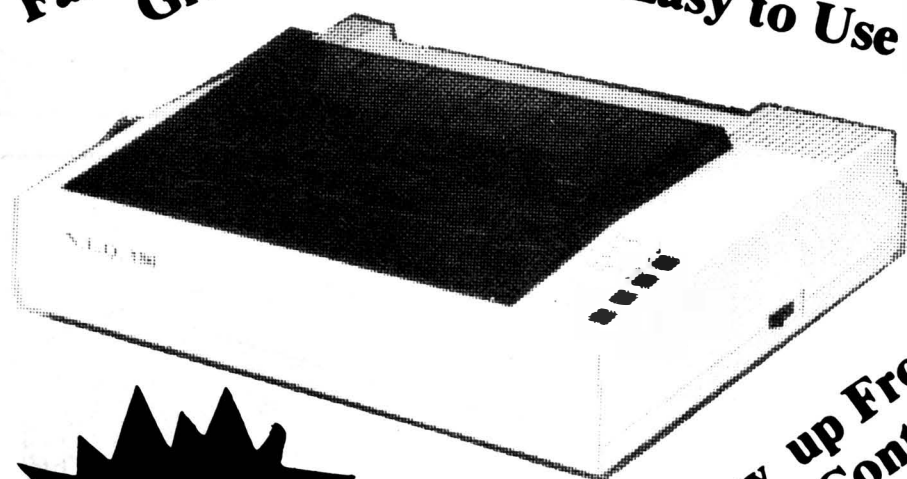
60% OFF LIST PRICE



**Fantastic
Graphics**

10" Carriage

Easy to Use



**All New up Front
Panel Controls**

NEW

Lifetime Warranty*

NLQ-180 Premium Quality Printer

**Near Letter Quality Selectable From Front
Panel Controls • High Speed Dot Matrix •
Letter Quality Modes • 8K Buffer frees up
computer 4-times faster • Pica, Elite,
Italics, Condensed • Super Graphics •
Business or Personal • Tractor/Friction •
15 Day Free Trial • Lifetime Warranty on
Print Head* • 6 Month Immediate
Replacement Warranty •**

NLQ-180 Print Samples

This is an example of ITALICS
Enhanced Boldface
Condensed Text Double-strike
example of Near Letter Quality

APPLE — ATARI — EPSON — NLQ 180 SPECIFICATIONS — IBM — COMMODORE — ETC. —

Print Buffer

8K bytes utility buffer

Printing Direction

Text Mode — Bi-directional

Graphic Mode — Uni-directional

Interface

Centronics type parallel (8-bit)

Paper

Plain paper, Roll paper, Single sheet

Fanfold, Multipart paper: max. 3 sheets
(original plus 2 copies)

Character Fonts

Pica, Elite, Italics, Condensed

Printing Method

Impact dot matrix

Printing Speed

160-180 CPS at standard character printing

Printing Characters

Standard 9 x 9 dot matrix

NLQ 12 x 18 dot matrix (33cps)

Character size: 2.12 x 2.8 mm (standard)

Character sets: Full ASCII character set (96)
32 International characters

Ink Ribbon Cartridge

Ribbon Life: 3 million characters/cartridge

Physical Dimensions

Size: 15" x 12" x 5"

Weight: 12.7 lbs.

Maximum Number of Characters

Standard: 10 cpi 80 cpl

Standard enlarged: 5 cpi 40 cpl

Elite: 12 cpi 96 cpl

Elite enlarged: 6 cpi 48 cpl

Condensed: 17 cpi 132 cpl

Condensed enlarged: 8.5 cpi 66 cpl

Condensed elite: 20 cpi 160 cpl

INTERFACES

Atari \$39.95 Apple \$49.95 Commodore \$29.95 IBM \$49.95 Laser \$19.95

Add \$10.00 for shipping, handling, and insurance. Illinois residents please add 6 1/4 % sales tax. Add 20.00 for CANADA, PUERTO RICO, HAWAII, ALASKA, APO-FPO orders. All orders must be in U.S. Dollars. WE DO NOT EXPORT TO OTHER COUNTRIES EXCEPT CANADA. Enclose Cashier Check, Money Order or Personal Check. Allow 14 days for delivery, 2 to 7 days for phone orders, 1 day express mail. Prices & Availability subject to change without notice.

VISA — MASTER CARD — C.O.D.

C.O.D. on phone orders only.

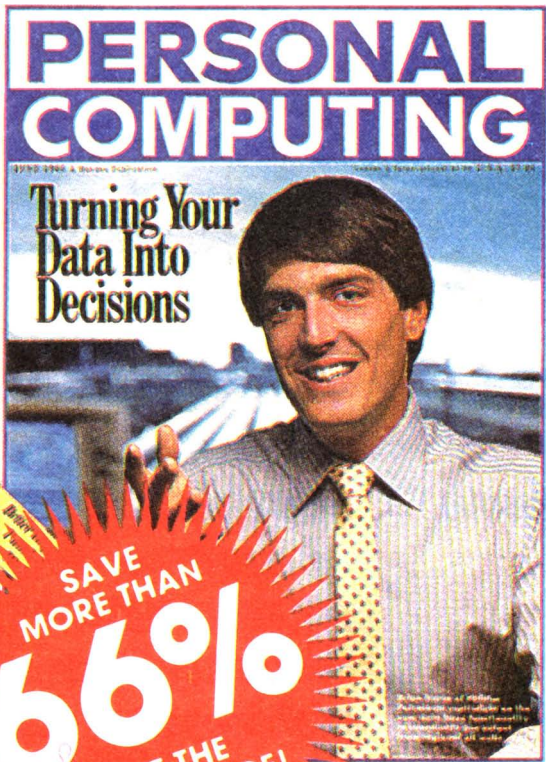
COMPUTER DIRECT

We Love Our Customers

22292 N. Pepper Rd., Barrington, Ill. 60010

312/382-5050 to order

(For More Information Circle 101)



IMPORTANT:
Your subscription may be TAX DEDUCTIBLE!
Please allow 4-6 weeks for delivery of your first issue. Canadian and Mexican residents add \$4.00 per year. Other foreign subscriptions add \$8.00 per year. (Payment MUST accompany all overseas orders.)
*Basic Subscription Rate \$18.00.

Can you afford not to read **PERSONAL COMPUTING** every month?

Please send me 12 issues of PERSONAL COMPUTING for the money-saving rate of \$11.97. That's more than a 66% savings off the \$3.00 cover price.

NAME _____ TITLE _____
(please print)

COMPANY _____

Please send PERSONAL COMPUTING to the address below:
This is my ☐ home ☐ office address

STREET _____

CITY/STATE/ZIP _____

☐ Bill me later ☐ Payment enclosed (please enclose in envelope) 4EMY4



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES



BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 232 BOULDER, CO.



POSTAGE WILL BE PAID BY ADDRESSEE



P.O. BOX 2941
BOULDER, CO. 80321



Two Apple® computers in one. Runs virtually all Apple IIc and IIe programs (over 10,000).

Complete Apple® Compatible Word Processing System

• 15 Day Free Trial

• 90 Day Warranty

Home • Business • Word Processing

Complete System
\$499.00

• 15 Day Free Trial
• 90 Day Warranty



Look At All You Get for only \$499.00

- Laser 128 Apple Compatible Computer
- Big Blue Printer
- 12" Hi-Resolution Monitor
- Magic Window IIe wordprocessor
- Magicalc Spreadsheet
- Magic Memory Data Base
- Laser 128 Big Blue Printer Interface
- 2 Rolls of Paper

List Price

\$499.00
199.00
229.95
150.00
150.00
60.00
19.95
19.95

Sale Price

\$395.00
39.95
99.95
39.95
39.95
29.95
12.95
9.95

Totals

\$1327.85

\$667.65

Save over \$100

All 8 only

\$499.00

System Sale Price

Magic Window IIe

Word processing is easy and more efficient because of a simple-to-read menu system and editing commands. The powerful features include: on-screen centering and page breaks, tab setting, search and replace and title lines. With just a few keystrokes you can correct typos, add or delete words, sentences, or paragraphs. Supports virtually all major printer functions. Operates in 80 columns with Laser128. Package includes program and driver diskettes, four color reference card, and manual.

Magicalc

Rated as the best electronic spreadsheet on the market for Apple. The speed with which Magicalc solves number problems allows you to accurately analyze decisions beforehand. Features include: variable column widths, 28 arithmetic/logic functions, true/false statements, hidden and protected cells. Will automatically format your worksheet and custom formatting is also available. Supports multiple RAM cards of most manufacturers in any combinations (including multiple language cards) up to a full 512 K.

Magic Memory

File anything, any way you want to: names, addresses, important numbers, dates and notes. Features include: single key commands, individual line sort, and hold buffer for cross referencing. Your information is organized simply, easy to maintain, and available instantly. Supports all popular printers and video cards.

Add \$35.00 for shipping, handling and insurance. Illinois residents please add 6½ % sales tax. Add \$70.00 for CANADA, PUERTO RICO, HAWAII, ALASKA, APO-FPO orders. All orders must be in U.S. dollars. WE DO NOT EXPORT TO OTHER COUNTRIES, EXCEPT CANADA. Enclose Cashier Check, Money Order or Personal Check. Allow 14 days for delivery, 2 to 7 days for phone orders, 1 day express mail! Prices & Availability subject to change without notice.
VISA — MASTER CARD — C.O.D. C.O.D. on phone orders only

Computer Direct

We Love Our Customers

22292 N. Pepper Rd., Barrington, Illinois 60010

312/382-5050 to order

(For More Information Circle 101)

**ORDER
LINE
800-354-7330**

SILICON SPECIALTIES

**LOWEST PRICES
NO SURCHARGE
ON BANK CARDS**

ZENITH COMPUTERS
Always the
lowest prices.
Call us for
a quote.

PRINTERS

Alps 2000	\$715
2100	\$1145
Brother All Models	Save
Citizen MSP-10	\$260
MSP-15	\$379
MSP-20	\$319
MSP-25	\$475
Premier 35	\$475
Diablo D-25	\$469
635	\$765

EPSON

All Printer Models **Save**

IBM Proprinter	\$399
NEC	
3510, 3550	\$729
8810, 8850	\$1045
P5	\$959
P6	\$429
P7	\$609

OKIDATA

All Printer Models **Save**

Panasonic 1080 I	\$195
1091 I	\$259
1092 I	\$319
1592	\$409
3131	\$245
3151	\$385

STAR MICRONICS

All Printer Models **Save**

KEYBOARDS

Keytronics 5151	\$159
-----------------	-------

Toshiba

321 Parallel & Serial	\$455
341E Parallel	\$669
351 Model II	\$1045
Laser Printer	Save

DISKETTES

Maxell M2 S (Qty 100)	\$85
Sony MD/2 (Qty 100)	\$85

MONITORS

Amdex All Monitors	Save
NEC Multisync	\$575
Multisync Graphic Board	Save
Princeton Graphics	Save
Zenith All Models	Save

VIDEO TERMINALS

Qume QVT Green 101	\$299
QVT Amber 101	\$314
Wyse 30	\$295
50	\$369
75	\$559
Wyse 85	\$439
Wyse 350	\$859
Zenith All Monitors	Save

DISK DRIVES

Imomega Be noulli 10 meg	\$1195
Bernoulli 20 meg	\$1595
Bernoulli 40 meg	\$2325

SEAGATE

20 meg	
w/Western I/O	\$385

HARDWARE

MODEMS

Anchor Automation	\$185
Signalman Express	
Practical Peripherals	
Practical 1200 Baud	\$124

HAYES

All Modems **Save**

Prometheus All Models	Save
US Robotics Courier 2400	\$349
Password 1200	\$165
Microlink 2400	\$349

BOARDS

AST All Models	Save
Hercules Color Card	\$149
Graphic Card	\$179
Intel Above Board PS/PC (1110)	\$239
Above Board AT (2010)	\$329
Above Board PS/AT (2110)	\$369
Above Board PC	\$210
NEC Multisync Graphic Board	Save
Orchid Tiny Turbo 286	\$415
Turbo EGA	\$565
Paradise Five Pak	\$99
EGA Autoswitch	\$359
Plus Development	
Plus Hord Cord 20 Megabyte	\$609
Quadram Quad EGA +	\$359
Tec Mar Graphics Master	\$409
Captain No Memory	\$109
EGA Master	\$239
Video-7 Vega Enhanced	
Graphics Adapt	\$279
VegaDeluxe	\$335

SOFTWARE

IBM PC AND 100% Compatibles

INTEGRATIVE SOFTWARE

Enable 1.1	Save
Framework II	Save
Smart Software System	\$399
Symphony	Save
Ability	\$55

GRAPHICS

Chartmaster	Save
Diagram Master	Save
Energographics 2.0	\$269
In-A-Vision	\$259
Microsoft Buss Mouse 6.0	\$106
Microsoft Chart	\$164
Microsoft Serial Mouse 6.0	\$119
Newsroom	\$31

PC Buss Plus Mouse

w/Point Plus	\$115
Click Art Personal Publisher	\$99
IMSI Mouse w/Dr. Halo II	\$99
PC Paint w/Mouse	\$115
Printmaster	\$29
Signmaster	Save
Turbo Graphix Tool Box	\$38

MONEY MANAGEMENT

Dollars & Sense w/Forecast	\$92
Tobias Managing Yo r Money	\$105

DATA BASE MANAGEMENT

Clipper	\$329
Cornerstone	\$55
dBase II	Save
dBase III Plus	Save
Extended Report Writer	Save
Knowledgemon II PromoPack	\$295
PFS: Professional File	\$119
Quickcode Plus	\$138
QuickReport	\$138
Reflex	\$82
Think Tank	\$91

R:Base 5000

System V **\$355**

SPREADSHEETS

Lotus 1-2-3	Save
Multiplan	\$108
Spreadsheet Auditor 3.0	\$82
VP Planner	\$47

Supercalc 4 **\$269**

COMPUTERS

IBM

PC 1 Drive 256K	\$1199
XT 1 Drive 256K	\$1729
XT 1 Drive 20 Meg 640K	\$2169
AT/68	\$2849
AT/339	\$4449

COMPAQ

Pa table li—2 Drive	\$1649
---------------------	--------

PANASONIC

Business Partner	819
Sr. Partner	\$979
Exec. Partner	\$1309
Other models	Save

TOSHIBA

T-1100	\$1299
T-1100 Plus	\$1619
T-3100	\$3049

Zenith Computer Products

SAVE Up to 50%

All Models **Save**

PLOTTERS

Epson Hi-80	Save
-------------	------

UTILITIES

MS Windows	\$55
Copy II PC	\$19
1 DIR	\$46
Fastback	\$84
Norton Utilities 3.1	\$48
Printworks	\$36
Sidekick (Unprotected)	\$47
Travelling Sidekick	\$39
Sideways 3.1	\$34
Superkey	\$39
Xtree	\$27
SQZ	\$58

WORD PROCESSORS

Leading Edge Word Processor	\$19
Leading Edge W/P w/Spell & Mail	\$32
Lightening	\$55
Microsoft Word 3.1	\$249
Multimate Advantage	\$299
Wordstar w/Tutor	\$162
Wordstar Pro Pack	\$233
PFS: Professional Write	\$95

Word Perfect (Ver.4.2) **\$199**

Wordstar 2000 + 2.0 **\$278**

Many other titles available.



mi
Turbo PC/XT

\$425

256 Memory, One 360K Brand Name • Floppy Drive
135 Watt Power Supply, Slide Case, AT Style Keyboard
8 MHz Clock Speed, (Keyboard Selectable), 8 Expansion Slots

SPECIAL
Over \$200 worth of
Paperback Software Programs
\$39 with each system

Turbo PC/XT w/640K & 1 Drive	\$465
Turbo PC/XT w/640K & 2 Drives	\$545
Turbo PC/XT w/640K, 1 Drive & 20MG	\$875
MonGraphics Card with Parallel Printer Port	\$ 69
Color Card with Parallel Print Port	\$ 65
Multifunction Card w/Software	\$ 79
Amber Monitor (TTL)	\$ 89
Amber Monitor w/Swivel Tilt	\$ 99
Color Monitor (RGB)	\$279
Sega Enhanced Graphics Card	\$199
I/O Card (Serial/Parallel)	\$ 38
I/O Card (Serial/Clock Calendar)	\$ 39
5151 Clone Keyboard	\$ 65



SILICON SPECIALTIES
2034 WEST SOUTHERN
MESA, ARIZONA 85202
602-461-0020

CWS-187

Product shipped in factory cartons with manufacturer's warranty. Please add \$10.00 per order for UPS shipping. Prices & availability subject to change without notice. Send cashier's check or money order... all other checks will delay shipping two weeks.

Dialog Business Connection: How to Go From \$500 to \$15.5 Million

In 1976, with three partners and \$500, Ann Winblad founded a small software company. In 1983, they sold their company to UCCEL for \$15.5 million. Her career has been extensively reported in **FORTUNE**, **MONEY**, **COSMOPOLITAN** and **SCIENCE DIGEST**. Now, as a San Francisco-based consultant, entrepreneur and long-time Dialog customer, she discusses her use of the new Dialog Business Connection_{sm}.

"Most business people don't use online information services, because they think those services are prohibitively expensive. Or they think infrequent use means they have to re-study the manual for an hour before logging on. In either of the above cases, many businesses tend to cut corners. Sometimes, they cut the *wrong* corners.

"The Dialog Business Connection is a corner no businessperson can afford to cut. For less than the price of the average PC software package, your computer and modem *could* completely pay for themselves in one online session. Really.

"When I am retained by a new client, Dialog's databank of 10 million businesses gives me a complete overview of their industry. My clients tend to spend significantly on proprietary market research. Frankly, I use the Dialog Business Connection to validate that research.

"Because it's menu driven, even the infrequent user can complete a Dialog Business Connection session in ten or fifteen minutes. From corporate intelligence on my client's competitors to financial screening of potential acquisitions or investments. From detailed information on potentially new markets and recent trends to prospecting for their sales force. Before Dialog, I was in the stone ages.

"How do you turn \$500 into \$15.5 million? Simple. You find a need and fill it.

"For less than the price of the average PC software package, your computer and modem could completely pay for themselves in one online session."

"With the Dialog Business Connection, I help my clients identify those needs, plan their strategy and execute their plan. It's a good way to get started with Dialog (you'll be amazed to discover their other knowledgebases). It's also a good way to know your market better than your competition."

Your window to 10 million businesses is only a phone call away. You are cordially invited to try the Dialog Business Connection. For only \$120 you'll receive the Dialog Business Connection package, including your own private password and credit for up to \$100 of online time. You'll also receive Dialog's own communications software, DIALOGLINKTM, which can save you connect charges by allowing you to create your queries before you log on. Your satisfaction is unconditionally guaranteed or we'll refund your \$120.

Call 800-3-DIALOG today.

DIALOG

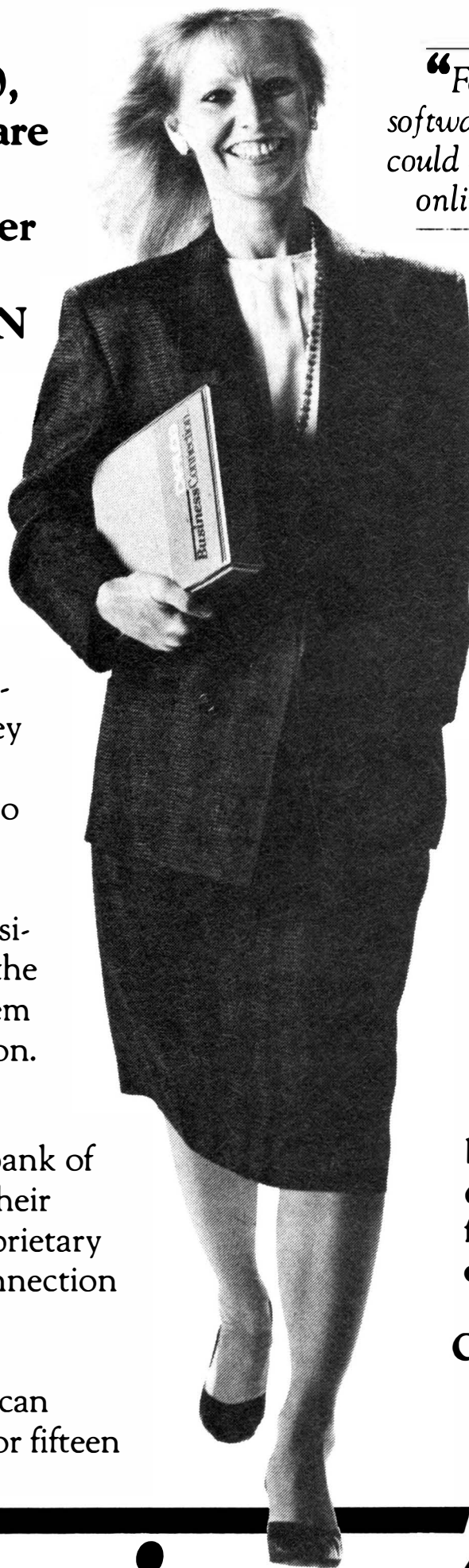
Business Connection_{SM}

PART OF THE WORLD'S LARGEST ONLINE KNOWLEDGEBANK

3460 Hillview Avenue, Palo Alto, CA 94304

© 1986. Dialog Business Connection_{sm} of Dialog Information Services, Inc., a subsidiary of Lockheed Corp. TRBA.

(For More Information Circle 65)



NewViews Accounting!



Know Now!

Know Why!

NewViews manages your accounting with a single consistent approach. One program, one manual, one price. No separate modules!

Know How!

NewViews is accounting you can understand. You can see what you're doing, in real time. You no longer need modules, batches, journals, trial balances, charts of accounts, or systems flow diagrams, and you never have to close the books.

Know Now!

To understand NewViews, reach for the phone. The illustration above is all you need to see how NewViews works and why it is completely different from all other accounting systems. When you understand, your search will be over.

See NewViews in Action!

Call (416) 923-4567 to reserve seats for a free seminar. They are ideal for evaluation, orientation and training.

System Requirements

NewViews runs on IBM and compatible personal computers. It requires a hard disk, 256K RAM, any monitor, and DOS 2.0 or later. Information can be imported and exported to other popular software packages. Companies, reports, accounts, transactions, branches, departments, etc., are limited only by your disk. NewViews is not copy-protected.

NewViews!

Complete Financial Accounting for \$695.00
Q.W.Page Associates Inc. (416) 923-4567



SCHEDULE OF FREE SEMINARS

ATLANTA Feb. 25, Mar. 16, Apr. 8; BALTIMORE Mar. 3, Apr. 3; BIRMINGHAM Mar. 13; BOSTON Feb. 17, Mar. 12, 23, Apr. 10, 21; BUFFALO Apr. 9, Mar. 12;
CHICAGO Feb. 19, Mar. 18, 30, Apr. 22; CINCINNATI Mar. 4, Apr. 2; CLEVELAND Mar. 10, Apr. 7; COLUMBUS Mar. 6, Apr. 3; DALLAS Mar. 2, Apr. 3, 23;
DENVER Mar. 24, Apr. 29; DETROIT Feb. 17, Mar. 16, Apr. 8, 21; FRESNO Mar. 4, Apr. 7; GREENSBORO Apr. 1, 30; HARTFORD Feb. 20, Mar. 11, Apr. 23;
HOUSTON Mar. 9, 30, Apr. 21; INDIANAPOLIS Mar. 2, Apr. 1; JACKSONVILLE Feb. 23, Mar. 18; KANSAS CITY Feb. 25, Mar. 23, Apr. 27; LONG ISLAND
Mar. 5 Apr. 6; LOS ANGELES Feb. 23, Mar. 2, 19 Apr. 8, 22; MEMPHIS Feb. 27, Apr. 6; MIAMI Feb. 20, Mar. 23, May 1; MILWAUKEE Feb. 20;
MINNEAPOLIS Feb. 23, Mar. 20, Apr. 24; MONTREAL Feb. 16, Mar. 24; NEW ORLEANS Mar. 11, 27, Apr. 27; NEW YORK Feb. 24, Mar. 9, 25, Apr. 7, 24;
NEWARK Feb. 25; ORLANDO Mar. 20; OTTAWA Feb. 17, Mar. 23; PHILADELPHIA Feb. 27, Mar. 27, Apr. 27; PHOENIX Feb. 27, Mar. 23, Apr. 20;
PITTSBURGH Mar. 9, Apr. 6; PORTLAND Mar. 9, 31; PROVIDENCE Feb. 18, Apr. 9; SACRAMENTO Feb. 17, Mar. 16, Apr. 24; SALT LAKE CITY Mar. 25,
Apr. 27; SAN ANTONIO Mar. 5, Apr. 1; SAN DIEGO Feb. 25, Mar. 20, Apr. 10; SAN FRANCISCO Feb. 18, Mar. 6, 17, Apr. 6, 30; SAN JOSE Feb. 20, Mar. 5;
SEATTLE Mar. 11, Apr. 1; ST. LOUIS Feb. 27, Mar. 27, May 1; TAMPA Feb. 18, Mar. 25, Apr. 29; TORONTO Feb. 19, Mar. 5, 19, 26, Apr. 2, 16, 30;
VANCOUVER Mar. 13, Apr. 2; WASHINGTON Mar. 2, 30, Apr. 28.

(For More Information Circle 76)

SPREADSHEET ADD-ONS

by Suzanne Quigley

Not so long ago, all that was expected of a spreadsheet was that it serve as a what-if tool, calculating relationships between variables. But the more financial analysts, engineers, business people, and a growing number of other users came to depend on the spreadsheet, the more they began to feel the need to add features. At first, these took the form of elaborate scripts, or macros, that individuals would write to help speed up their work. Later, commercial products began appearing to enhance the capabilities of such core programs as Lotus 1-2-3, Symphony, SuperCalc 3, MultiPlan, PFS:Professional Plan, Framework, and VP Planner.

For the experienced spreadsheet user, a utility program that, for example, can print sideways, link spreadsheets, attach notes to cells, or add word processing features is becoming more of a necessity than a luxury. These utilities add considerable value to the already indispensable spreadsheet, enabling the user to create larger and more complex documents.

Add-ons are continually expanding in capability. For \$50 to \$200, users can now transform a spreadsheet program into a "software operating environment," a term coined by Rick Gibson, executive director of the Consortium, Inc., a marketing, development, and information source for the 1-2-3 aftermarket, and the chairman of 4-5-6 World, a national direct-mail-order house for, and reseller of, 1-2-3 enhancement products. Such a software operating environment supplies a combination of such functions as spreadsheet, word processor, data base, and graphics. No longer does the user need to leave the spreadsheet to perform

other applications; with the addition of utilities, everything can be done from within the worksheet.

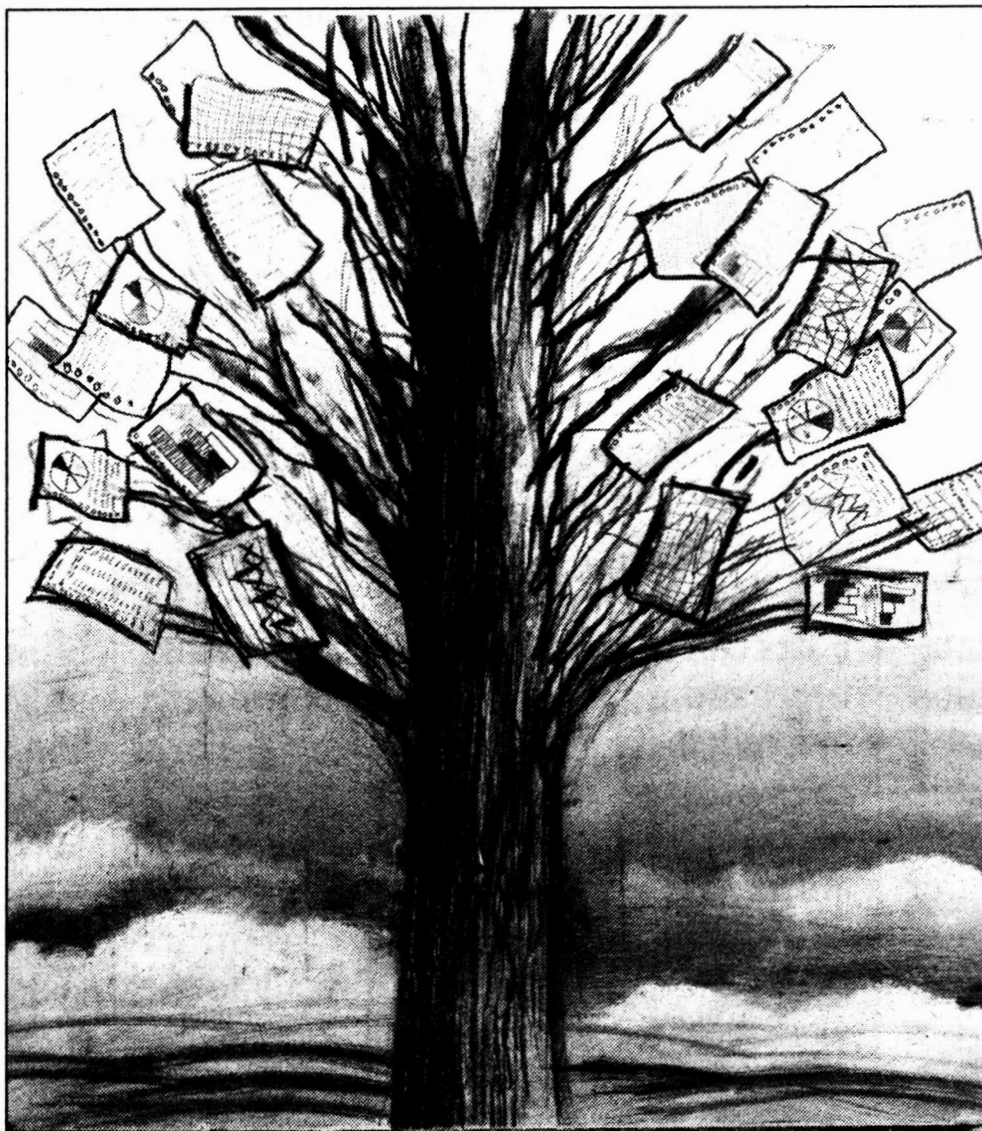
Lotus 1-2-3, with more than 2 million users, offers a massive installed base for add-ons. Now a user can wrap words to create longer documentation, link spreadsheets, list relations between formulas, and analyze the entire range of what-if possibilities to recommend the

ment for add-on packages. When they developed these programs, they stuck to the basics, leaving plenty of room for enterprising software manufacturers. The evolution of a product such as 1-2-3, Gibson says, "has actually been caused by the revolutionary inventions by independent software manufacturers."

There are a thousand or so add-on products on the market designed to enhance spreadsheets, too many for a single listing. We have concentrated on utility add-ons priced at less than \$150. We excluded templates, which are products with formatting commands and macros that are loaded into the spreadsheet, providing a dedicated application such as accounts receivable. Instead, we concentrated on products such as word processing add-ons and print utilities, that work in harmony with the core spreadsheet to enhance its capabilities. The categories we chose include spreadsheet auditing, general utilities, graphics, macros, printing, and text editing.

Among the many spreadsheet add-ons on the market, the trend is toward word processing, communications, and RAM-resident applications. RAM residency is becoming increasingly important because the spreadsheet itself remains in memory. A spreadsheet user can punch a hot key, perform a function, then return immediately to the spreadsheet.

There are over a thousand add-on products available, and each appeals to the needs of the variety of users who employ spreadsheets in their daily business. Spreadsheet utility products for business applications include the Professional Real Estate Analyst, Ready-to-Run Accounting, Timeslips, and XYZ Query.



best result for a given set of goals. In the software marketplace, where a new product may cost the user up to \$500, spending \$50, \$100, or \$150 for increased functionality is a price many users are glad to pay. To these users, the core spreadsheet is like a home that an owner adds rooms to, increasing both the value and the usefulness of the home.

The creators of spreadsheets such as SuperCalc, Symphony, and especially 1-2-3 inadvertently created the environ-

The Professional Real Estate Analyst is a RAM-resident package that is fully menu driven, performing cash-flow analyses, income statement generation, and evaluation of both residential and commercial properties. The package also reflects recent changes in the tax laws. With this utility, a user can easily create a five-year cash-flow analysis and provide reports in formats used by the Real Estate National Marketing Institute.

For those business people who need to link and summarize multiple worksheets, utility packages such as XYZ Consolidate and XYZ Query are good choices. The user who needs to treat worksheets as a multidimensional data base, or summarize and consolidate different worksheets, will find either of these add-on tools useful. For \$145 per title, the sophisticated spreadsheet user can both summarize and compare multiple spreadsheets with Consolidate and treat these worksheets as a single data base, extracting data from them easily with Query.

Utility products such as Hal are designed to make working with a spreadsheet much easier. Hal, an enhancement product exclusively for 1-2-3, allows users to substitute English language phrases for 1-2-3 commands, while adding some new options: undo the last command, list relations between formulas, and even link multiple spreadsheets.

Spreadsheet users who wish to convey information created in their worksheets with the aid of bar graphs, pie charts, and the like are relying heavily upon graphic add-ons. Business people have come to appreciate the value of visual presentations in conveying data, and companion products such as Datasurf version 1.2 and Schedule Grafix version 2.0 are making things very much easier. With Datasurf version 1.2, a manufacturer can dramatize the growth of his or her product line by producing some three-dimensional graphics and charts from data tables built by the spreadsheet. Schedule Grafix version 2.0 advances visual presentations a step further by generating presentation quality schedules. Most graphic utility packages on the market support most popular dot matrix and laser printers, so high-quality bar graphs, pie charts, and schedules can be produced quickly and easily.

Among products that can work with text, 4Word, Note-it, and Ready are three RAM-residents that have attracted some attention. 4Word is a true add-in tool. Unlike most RAM-resident pro-

grams that pop up on the screen when a hot key is pressed, 4Word is integrated directly into the spreadsheet. Developed using the newly created 1-2-3 Developer Tools from Lotus Development Corp., this utility actually becomes part of 1-2-3, sharing resources with the spreadsheet. The 1-2-3 Developer Tools enable software developers to make products that will offer seamless integration with 1-2-3. These products nestle into 1-2-3 and require minimal RAM. Like stand-alone RAM-residents, they are activated

**Spreadsheet utilities
provide the
extra power and
flexibility that
spreadsheet users
have come to
value and demand.**

with a single keystroke, but they are much less likely to cause memory conflicts and system crashes.

Note-it allows a user to attach Post-It style notes anywhere in a spreadsheet, with up to a hundred note cards per worksheet; then it searches through the notes for familiar words or phrases. The notes can be displayed or printed at any time, and if the user moves the contents of a cell, the note goes along with it. For a sales manager who needs to create complex worksheets of regional sales, for example, Note-it could prove invaluable; any comment or question to his or her sales staff will be attached directly to the worksheet for later revision.

Ready is a RAM-resident outline processor (it also works with applications other than spreadsheets) that would enable this same sales manager to organize facts and ideas in outline form. Ready could help design a worksheet, since it can empty an outline right into the core spreadsheet. An appointment calendar is also included in the program.

Among macro utilities, 101 Macros and KeyMac offer increased functionality at nominal cost. 101 Macros is a collection of such macros and utilities as word processing, graphics, math func-

tions, pop-up notepad, appointment calendar, and calculator. For any 1-2-3 or Symphony user, this collection of macros should make life easier. KeyMac allows the frequent worksheet builder to capture keystrokes in a buffer, converting them into their macro equivalent.

Equally important to many spreadsheet users are those generic add-on utilities that make saving, protecting, and rescuing spreadsheets a simple process. Packages that can save spreadsheet data at regular intervals, reformat the data into a spreadsheet, protect worksheets by assigning passwords, retrieve and recover some lost or corrupted spreadsheet data, and add memory without an expanded memory board are some of the luxuries available. Though none of these packages is a real requirement for working with spreadsheets, each does make life with a computer a little more secure.

Printing utilities are the most consistently popular spreadsheet utilities. SideStep, Sideways, and Twist and Shout all allow users to print their worksheets sideways. For no more than \$70 each, these programs enable users to rotate spreadsheets sideways, produce varied typefaces, and access most printers.

Because these utility packages provide extra power and flexibility, frequent spreadsheet users have come to appreciate and demand them. As a result, Rick Gibson predicts a dozen new products in the first quarter of 1987.

Among these new products are add-in utilities that make use of the Lotus 1-2-3 Developer Tools. Like 4-Word, these utilities work in harmony with 1-2-3, providing features like 1-2-3-style menus and single-keystroke commands.

Some of the new entries include Softbridge Unity, a 1-2-3 integrator by Softbridge Microsystems Corp.; InWord and Noteworthy, a word processor and a cell annotator made by Funk Software; PlusWords, a word processor from Amazon Systems, Inc.; CatSup, a worksheet retrieval utility from Applied Decision Technology; Write-In, a word processor from Blossom Software Corp.; Informix Datasheet Add-In, a data base from Informix Software, Inc.; Kelpro, a financial projection system from Kel Systems Inc.; and SeeMore, a worksheet display utility from Personics Corp.

With such a steady influx of utility packages, a saturation of products is a distinct possibility. As that point approaches, the actual needs of users will determine which products succeed.

SPREADSHEET ADD-ONS *The products below provide extra capabilities for spreadsheets. The spreadsheet compatibility column indicates which spreadsheets listed will work with the corresponding add-on utility. RAM-resident add-ons are so designated in the RAM-residency column; additional information is listed in the description and features section.*

PACKAGE/Company	PRICE	SPREADSHEET COMPATIBILITY	RAM - RESIDENT	MEMORY REQUIRED*	DESCRIPTION AND FEATURES
APPLICATIONS					
Goal Seeker <i>Brown Bag Software</i>	\$69.95	Lotus 1-2-3 (all versions); SuperCalc 3,4; MultiPlan; VP Planner	Y	40k	A goal-seeking program; manipulates cells to achieve the predefined result; uses 1-2-3-like commands; sets parameters of the goal; includes macros and templates for each separate spreadsheet
Goal Solutions <i>Enfin Software Corp.</i>	\$79.95	Lotus 1-2-3 (all versions up to release 2.1)	Y	60k	A goal-seeking program; features backward projections; allows simultaneous seeking of multiple goals; 1-2-3-style menu; pop-up windows
Professional Real Estate Analyst <i>Coral Software</i>	\$149	Lotus 1-2-3 release 2.1	Y	100k	Fully menu-driven; provides an income and expense report, five-year cash-flow analysis, and reports in RNMI (Real Estate National Marketing Institute) formats; calculates before-and-after tax rate of return, internal tax rate of return, future wealth, and net present value; evaluates both residential and commercial properties; updated to reflect current tax laws
Timeslips <i>North Edge Software Corp.</i>	\$99.95	Lotus 1-2-3 (all versions); SuperCalc 3,4; MultiPlan; Symphony; Framework; PFS:Professional Plan; VP Planner	Y	49k	Time and Billing system, does time tracking and recording; downloads directly into spreadsheets; user-defined reports; includes bar graphs and pie charts
What's Best 1.2 <i>General Optimization</i>	\$149	Lotus 1-2-3 release 1A, 2, 2.01; Symphony 1.1 and higher; SuperCalc 4; VP Planner	N	256k	Analyzes a range of what-ifs to recommend a choice for a given set of goals; does mathematical optimization, dual-value capability, reduced costs, and shadow prices; creates vector product formulas
XYZ Consolidate <i>Intex Solutions, Inc.</i>	\$145	Lotus 1-2-3 (all versions), Symphony (all versions)	N	256k	Summarizes and compares multiple worksheets; customizes consolidation rules across worksheets; matches line items across different worksheets; offers roll-up options for consolidations
XYZ Query <i>Intex Solutions, Inc.</i>	\$145	Lotus 1-2-3 (all versions), Symphony (all versions)	N	256k	Treats multiple worksheets as a multidimensional data base; scans and extracts information and reports to either printer, screen, or new worksheet
XYZ Spread <i>Intex Solutions, Inc.</i>	\$145	Lotus 1-2-3 (all versions), Symphony (all versions)	N	256k	Transfers and links data across spreadsheets, showing source and target on-screen; performs downward allocations
AUDITING					
Cambridge Spreadsheet Analyst <i>Cambridge Software</i>	\$89.95	Lotus 1-2-3 (all versions), Symphony (all versions)	N	100k	Automatically searches through spreadsheets for problems or potential problems; shows all places where a chosen cell, range, or function is used, and includes an interactive debugging probe; provides analytical tools for exploring logic of a spreadsheet; provides reports for documentation; offers condensed map view for discerning patterns in a spreadsheet
Cell/Mate 1.2 <i>Clarity Software Corp.</i>	\$89	Lotus 1-2-3 (all versions), Symphony (all versions)	N	170k	Provides automatic documentation and error checking of spreadsheets by using the row labels and column headings already in the worksheet; documents circular error paths; shows all dependencies of a cell; shows all formulas that flow into a specific cell
The Spreadsheet Auditor 3.0 <i>Computer Associates Int'l, Inc.</i>	\$149	Lotus 1-2-3 (all versions), Symphony (all versions)	Y	256k	Analyzes and tests for spreadsheet accuracy and reliability; offers interactive error checking, pop-up cell notation, sideways printing, index reporting, relationship analysis, split screen viewing, map view, and range reports.
GENERAL UTILITIES					
Disk Optimizer 2.0 <i>SoftLogic Solutions</i>	\$59.95	Lotus 1-2-3 (all versions), Symphony (all versions), SuperCalc (all versions), MultiPlan, PFS:Professional Plan	N	128k	Ensures that files are stored in contiguous clusters on the hard disk; displays the number of clusters to be moved; puts spreadsheet fragments into a continuous mode
Hal <i>Lotus Development Corp.</i>	\$150	Lotus 1-2-3 (all versions except 1.0)	Y	512k	Enhancement product for 1-2-3; allows users to substitute English phrases for 1-2-3 commands and undo the last command; provides spreadsheet auditing analysis; lists relations between formulas; links spreadsheets; runs only with 1-2-3, requiring a total of 512k of system RAM to load both programs

*If the program is RAM resident, "memory required" refers to the actual memory consumed by the software; for non-resident software, this figure refers to the minimum system RAM required to load the program.



PANASONIC® PRINTERS. THEY'RE GENERATING A LOT OF GOOD PRINT.

The good reviews keep rolling in. And, as you can see, the critics agree: Panasonic printers are real winners!

But that shouldn't come as too big of a surprise.

After all, Panasonic printers offer the advanced features and

...y bad. Like their competition, the Panasonic machines are well made, sturdy printers that should serve well in the various applications for which they were designed. They are letter-quality text. About the

PC WEEK—JUNE 17, 1986

ease-of-use you've come to expect from Panasonic.

So, whether your business is big, small or in-between, you'll find a printer with features to love every bit as much as the critics. Like—as one

with this little printer.

As far as I'm concerned, the KX-P1091 produces not near letter quality but rather true letter quality in this mode. You'd really have to strain to distinguish it from typewriter quality. Knowing that the test out was printed by the company produced fast, courteous, and knowledgeable answers.

PC—SEPT. 17, 1985

reviewer observed—extraordinary near-letter-quality on our dot matrix models. They also come standard with impressive high-resolution graphics capability. So you can add graphs, charts, illustrations—even your company's logo.

Not to be outdone, all our daisy wheel printers give you sophisticated advances like boldface, shadow and underline.

Of course, we've put just as much care into the human side of our printers, too. You'll find

switches and buttons that let you change print sizes and styles right on the printer rather than through the computer. And, with our continuous, self re-inking ribbons, you'll find yourself changing ribbons

less often. When you do, our snap-in cartridge makes it a snap.

...and performance of the KX-P5151. It is a well-built product that promises to deliver many hours of trouble-free operation. The print quality is clear and well-defined. The alignment of characters on adjacent lines is also excellent, a sign of a well-designed paper and printwheel transport system.

PC PRODUCTS—APRIL, 1985

Finally, just when you thought all this would be hard to top, there's more: all our printers are backed with an unprecedented two-year limited warranty.

Now that you've reviewed all of this for yourself, call toll-free 1 (800) PIC-8086 for the name

ed. / with 30.1 pounds. Like all the Panasonics we tested at, the 1592 comes with the company's exceptional two-year warranty. And like all of them, it definitely rates a look.

of the dealer nearest you. Or you can write to: Panasonic Industrial Company,

PRINTERS BUYERS GUIDE & HANDBOOK #3

Computer Products Division, Two Panasonic Way, Secaucus, NJ 07094. You'll see how easily Panasonic printers generate good print for you.

And you'll agree: **THE EASIER, THE BETTER.**

Panasonic
Office Automation 

(For More Information Circle 12)

PACKAGE/Company	PRICE	SPREADSHEET COMPATIBILITY	RAM - RESIDENT	MEMORY REQUIRED*	DESCRIPTION AND FEATURES
GENERAL UTILITIES (Cont.)					
Micro-VMS 1.0 <i>Vericomp</i>	\$75	Lotus 1-2-3 release 2.0, 2.1; Symphony 1.1 or higher; SuperCalc 3 (release 2.1), 4; Framework II	Y	70k	Simulates the Lotus/Intel/Microsoft expanded memory specification by entering data in a computer's hard disk or extended memory; enables users to build larger spreadsheets without additional hardware
SQZ <i>Turner Hall Publishing</i>	\$79.95	Lotus 1-2-3 release 1A, 2.0; Symphony; VP Planner	Y	30k	Compresses spreadsheet files; reduces size of spreadsheets by 80 to 95 percent when saving them to disk; sends spreadsheets in compacted form; "squeezes" multiple spreadsheets at one time; enables users of 1-2-3 1A to do password protection on files
Templates of Doom <i>Solar Systems Software</i>	\$49.95	Lotus 1-2-3 release 1A, 2.0; SuperCalc 4; VP Planner	N	256k	Learning tutorial to test and improve 1-2-3 abilities and to help users understand 1-2-3 commands by challenging them with puzzles that require 1-2-3 commands and formulas (among them are sorting a column of names, creating formulas, formatting cells or moving blocks of numbers); has four skill levels
Your Move <i>Goldata Computer Services, Inc.</i>	\$79.95	Lotus 1-2-3 (all versions), Symphony (all versions), SuperCalc (all versions), MultiPlan, Framework, VP Planner, PFS: Professional Plan	Y	30k	Transfers spreadsheet files to software programs without requiring rekeying; macro capability allows users to define single-keystroke macros; transfers data from applications software to spreadsheets
GRAPHICS					
Datasurf, version 1.2 <i>Bridge Software</i>	\$128	Lotus 1-2-3 release 1A, 2.0; Symphony (all versions); SuperCalc (all versions); MultiPlan; VP Planner; PFS: Professional Plan	N	320k	Produces three-dimensional graphs and charts from data tables; produces high-resolution graphics; offers plotter quality with a dot matrix; supports most plotters and dot matrix printers
Easy Color for Lotus 1-2-3 <i>The Binary Workshop</i>	\$49.95	Lotus 1-2-3 (all versions)	N	256k	Rewrites screen drivers of spreadsheets to provide control over 16 screen colors; changes the color of the background, foreground, protected ranges, pointers, graphs, and unprotected cells; is EGA compatible
Easy Color for Symphony <i>The Binary Workshop</i>	\$59.95	Symphony release 1, 1.01, 1.1	N	256k	Same as above, except not EGA compatible (CGA only)
Inset 2 <i>APG Software</i>	\$99	Lotus 1-2-3 (all versions), Symphony (all versions), SuperCalc (all versions), MultiPlan, Framework, PFS: Professional Plan, VP Planner	Y	125k	Text and graphics integrator; provides desktop publishing graphics features for spreadsheets; has graphics editor; can capture part or whole spreadsheet into a word processing document; can size 1-2-3 graphs and place them inside documents; supports EGA, CGA, Hercules, AT&T monochrome and DEB (Display Enhancement Board); supports all popular daisywheel, dot matrix, and laser printers
Schedule Grafix 2.0 <i>Digital Engineering</i>	\$235	Lotus 1-2-3 release 1A, 2.0; Symphony (versions 1.0 & up)	N	320k	Lotus 1-2-3-based scheduling program; generates presentation-quality schedules; supports all popular dot matrix and laser printers; supports EGA and Hercules graphics boards; generates plotter-to-printer and camera-to-monitor graphs; 512k is required for Symphony
MACROS					
101 Macros for Lotus 1-2-3 <i>Macropac International</i>	\$69.95	Lotus 1-2-3 (all versions)	N	256k	Adds word processing features to 1-2-3, including word-wrap; double-spaces 1-2-3 printouts or prints in elite type; creates graphic slide shows using 1-2-3; automatically addresses form letters and labels; adds menu-driven financial formulas and math functions; recalculates the range of a spreadsheet; includes a pop-up notepad, appointment calendar, and a calculator with scientific functions and memory
101 Macros for Symphony <i>Macropac International</i>	\$69.95	Symphony (all versions)	N	256k	Same as above, plus automatic building of custom-made forms; automatic bold and italic type, page breaks, and margins in sheet mode; provides insertion of subtotal lines and instant subtotal calculations; recalculation of spreadsheets by range; has Gantt-like project management scheduling
KeyMac <i>Fox & Geller</i>	\$49	Lotus 1-2-3 release 1A, 2.0	Y	256k	Allows users to create 1-2-3 keyboard macros by using the "learn mode" to capture keystrokes in a buffer; compresses 1-2-3's multikey instructions into single keystrokes

*If the program is RAM resident, "memory required" refers to the actual memory consumed by the software; for non-resident software, this figure refers to the minimum system RAM required to load the program.

Streamline your office



with a Tandy® 3000 HD multiuser system.

Multiuser efficiency

The Tandy 3000 HD is your key to total office automation. That's because it's designed to use the XENIX® System V multiuser operating system. With low-cost display terminals, a total of six users can share the power of the 3000 HD—allowing each to work independently on such projects as accounting, word processing and electronic filing.

Outperforms IBM® ... for less

The Tandy 3000 HD is compatible with the IBM PC/AT®—yet offers greater hard disk storage (40 megabytes vs. the PC/AT's 30), and is priced at only \$4299 (vs. \$5295 for the PC/AT*).

Advanced 286 technology

Based on the 16-bit Intel® 80286 microprocessor, the Tandy 3000 HD

operates at 8 MHz for high-speed performance. The 3000 HD features 640K main memory and a high-capacity 5¹/₄" disk drive that reads both 1.2 MB and 360K formats. This allows it to run either IBM® PC or PC/AT software.

Come in today!

The Tandy 3000 HD (25-4011) can improve the productivity in your office. Visit us today to see how streamlining can work for you.



Available at over 1200
Radio Shack Computer Centers and at
participating Radio Shack stores and dealers.

TANDY COMPUTERS: In Business . . . for Business™

*Based on IBM's price list as of April 2, 1986. Tandy 3000 HD price applies at Radio Shack Computer Centers and participating stores and dealers. Monitor, data terminals and XENIX not included. XENIX/Reg. TM Microsoft Corp. IBM and IBM PC/AT/Reg. TM International Business Machines Corp.

Radio Shack®
COMPUTER CENTERS

A DIVISION OF TANDY CORPORATION
(For More Information Circle 17)

PACKAGE/Company	PRICE	SPREADSHEET COMPATIBILITY	RAM - RESIDENT	MEMORY REQUIRED*	DESCRIPTION AND FEATURES
MACROS (Cont.)					
Menu System <i>Cottage Industries</i>	\$49.95	Lotus 1-2-3 (all versions), Symphony, SuperCalc 4, MultiPlan, PFS:Professional Plan	N	64k	Automates DOS commands; creates unlimited user-defined nested macros; prompts users for file names to be inserted into DOS commands; passes keystrokes through to the keyboard buffer; offers an unlimited number of user-definable submenus
Quickcode for 1-2-3 <i>Fox & Geller</i>	\$149	Lotus 1-2-3 release 2.0	Y	384k	Creates data entry forms for users of 1-2-3 data bases; Quickcode-generated data bases can also check entries for specific values or ranges of values; translates user-created macros into 1-2-3 format; stores keystroke commands in its macro buffer so you can replay the keystrokes from the buffer with the echo command; transfers macros between worksheets; features macro debugger
QuickMac <i>Fox & Geller</i>	\$129	Lotus 1-2-3 release 1A	Y	384k	Creates macros entirely within 1-2-3 environment; has 1-2-3-like menus; automatically formats programs and allows users to name them; incorporates a keyboard macro facility that allows users to store and retrieve repetitive or frequently used keystroke sequences; reduces the six or seven keystrokes for each 1-2-3 macro to a single keystroke; stores frequently used sequences in a library; lets users build a library of linkable subroutines
PRINTING					
SideStep <i>SoftCorp</i>	\$60	Lotus 1-2-3 (all versions), Symphony (all versions), SuperCalc (all versions), MultiPlan, VP Planner, Framework, PFS:Professional Plan	N	128k	Rotates spreadsheets 90 degrees and prints wide spreadsheets on one continuous sheet of paper; has eighteen combinations of type size; offers unlimited spreadsheet width; supports hard disk path commands; operates from the DOS command line, supports most popular IBM, Epson, Okidata, and compatible printers; supports IBM graphics characters; prints with double-strike or emphasized print
Sideways <i>Funk Software</i>	\$69.95	Lotus 1-2-3 (all versions), Symphony (all versions), SuperCalc (all versions), MultiPlan, VP Planner, Framework, PFS:Professional Plan	Y	20k/70k	Rotates spreadsheets 90 degrees; unlimited width; nine type sizes; bold, underline, and expanded features for 1-2-3 and Symphony; requires 70k for 1-2-3 and Symphony; memory requirement for all other spreadsheets is 20k
Twist and Shout <i>Spectre Technologies</i>	\$34.95	Lotus 1-2-3 (all versions), Symphony (all versions), SuperCalc (all versions), MultiPlan, VP Planner, Framework, PFS:Professional Plan	N	128k	Sideways printing, banner printing; offers unlimited spreadsheet width; three different typefaces that can be mixed, and letter height from two to eight inches; supports most popular dot matrix printers
TEXT EDITING					
4Word, The Add-In Word Processor <i>Turner Hall Publishing</i>	\$99.95	Lotus 1-2-3 release 2, 2.01	Y	48k	Attaches itself to 1-2-3; makes use of 1-2-3 commands to move and copy; gives users such word processing features as word wrap, block moves, and copy; contains print enhancements; integrates spreadsheet data into word processing documents
Note-It 2.0 <i>Turner Hall Publishing</i>	\$79.95	Lotus 1-2-3 release 1A, 2.0	Y	72k	Allows users to attach notes to different cells in a spreadsheet; searches through the notes for a specific string or word; highlights all cells containing notes with a single command; lists the cells that have notes attached to them and prints the notes in four different formats; can attach a note to a 1-2-3 file name; removes itself from memory as soon as the user exits 1-2-3
Ready <i>Living Videotext, Inc.</i>	\$99.95	Lotus 1-2-3 (all versions), Symphony (all versions), SuperCalc (all versions), Framework	Y	128k	Outline generator and file mover; documents spreadsheets; designs the left edge of the spreadsheet, then transfers it into any spreadsheet program; transfers outlines with a single keystroke; built-in outline processor; includes appointment calendar
SmartNotes <i>Personics Corp.</i>	\$79.95	Lotus 1-2-3 (all versions), Symphony (all versions), SuperCalc (all versions), MultiPlan, VP Planner, Framework, PFS:Professional Plan	Y	90k	Allows users to attach notes to spreadsheet cells, rows, column headings, or file names; offers unlimited number of notes, and up to 50 notes per note file in memory at any time; offers reconfigurable default settings that allow for changes in size and color of notes; offers four colors: red, blue, purple, and green

*If the program is RAM resident, "memory required" refers to the actual memory consumed by the software; for non-resident software, this figure refers to the minimum system RAM required to load the program.

Peachtree Complete Accounting for Just \$199

Everyone's Asking How Can We Do It?

When you reduce the price of an 8-package accounting system from \$4,800 (or \$600 a module) to \$199 for the complete set, people are bound to ask questions. Here are some of the most popular ones we're hearing at Peachtree:

Q. How can we afford to sell Peachtree Complete at such a low price?

A. We've **reduced our costs without reducing product features**. Peachtree Complete has been **repackaged** into one set that includes more thorough and better organized user instructions.

We've also streamlined order processing and reduced overhead. It is **faster and easier to buy** our product.

Peachtree has long been the first name in accounting software, so we've had time to completely amortize our original development costs plus make over 100 major additions. These **enhancements** include multi-company capability, menu driven installation and removal of copy protection. Consequently, you're getting a proven product at a better price.

We also "unbundled" **support** (so you only pay for what you need when calling our toll-free technical support hotline) and established a network of local dealers to serve as Independent Peachtree Support Centers.

Q. What does Peachtree Complete include?

A. 1. Eight Integrated Software Modules:

- General Ledger
- Accounts Receivable
- Sales Invoicing
- Accounts Payable
- Inventory Control
- Fixed Assets
- Job Cost
- Payroll

2. Installation Guide to lead you step by step through our simple installation procedure.

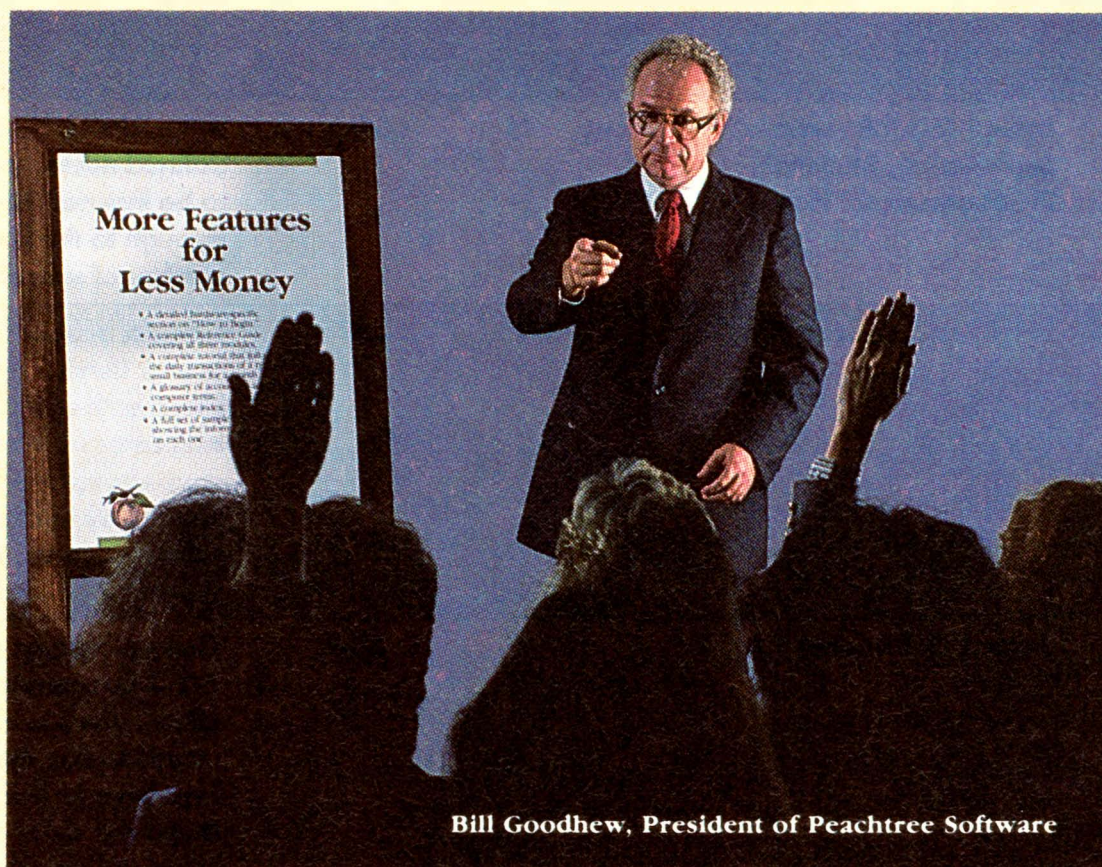
3. Accounting Primer, written for Peachtree users by an industry expert, to explain accounting concepts.

4. Tutorials on each module with sample data to make learning easier.

5. A complete Reference Library with detailed instructions in plain English on all software functions.

Q. Is Peachtree Complete really the same product that used to sell for \$600 per module?

A. Peachtree Complete is basically the same accounting system that both



Bill Goodhew, President of Peachtree Software

Peachtree and IBM sold for about \$5,000 but with substantial improvements in function and presentation.

Data files built with previous versions of the system are compatible, so many users are upgrading to Peachtree Complete to take advantage of the new features and benefits.

With more than 150,000 users to its credit, Peachtree Complete has been the **PC World Class Winner** in its category for two of the last three years.

Q. What's the difference between Peachtree Complete and the \$69.95 systems?

A. Peachtree's system is called Complete because it contains the eight most needed accounting packages (including payroll) and all reference materials for one price. Remember, it was **designed as a \$4,800 accounting software system**.

The \$69.95 systems, on the other hand, are incomplete. They were designed to sell for \$69.95 and require the purchase of additional modules to be comparable—payroll, \$49.95 more; tutorials, \$19.95 each; etc. Everything is a la carte.

Q. How soon will I outgrow the system?

A. Peachtree Complete handles revenues up to \$21,000,000, so only the largest companies will outgrow the system. The ability to **process data for at least 50 individual companies** is one of the system's biggest selling points.

The new optional **multi-user module** allows Peachtree Complete to be installed in a local Area Network, and **Peachtree Data Query**, for just \$199, lets you quickly transfer your accounting data to many popular spreadsheets

and databases, as well as produce custom reports.

Q. What if I'm not satisfied with Peachtree Complete?

A. When you purchase Peachtree Complete directly from Peachtree Software, you're protected with a **30-Day Money Back Guarantee** (an option even the most expensive accounting products don't offer).

If you're not satisfied, simply return the complete product in saleable condition within 30 days and your purchase price will be promptly refunded. For full details on our support plan and money-back guarantee, call the toll-free telephone number below.

PC Magazine Best of 1986

"Kudos to Peachtree, which woke up one morning and decided that its eight integrated accounting software modules, which the day before had sold for \$600 each, were at \$4,800 for the set, just a tad overpriced and so cut the price for the whole set down to \$199—a pretty good discount in anyone's league." —Jim Seymour, contributing editor of *PC Magazine*.

Compare Feature for Feature:

General Ledger

- Predefined and 25,000 user-defined Chart of Accounts
- Repeating journal entries
- Control report audit trail

Accounts Receivable/Invoicing

- Open item or balance forward customers
- Up to 12,000 customers
- Simultaneous updating of Inventory and A/R data files at time of invoice entry

Accounts Payable

- Selection of invoices for payment based on user-defined discount & due dates
- Up to 14,000 vendors
- Cash requirements forecasting by due date
- Checks printed with detailed stub listing invoices paid

Inventory

- Supports average, last purchase and standard costing methods
- Up to 21,000 inventory items

Fixed Assets

- 5 property and 8 asset classification categories
- 5 different methods of figuring depreciation

Job Cost

- Tracks costs and profitability on a job-by-job basis
- Compares estimated costs with actual costs for specific tasks

Payroll

- Built-in current year federal, state, city and county tax tables for all 50 states
- Automatic federal, state, city and county withholding calculations
- Supports hourly, salaried, commission or draw-against-commission pay types
- Processes up to 3,900 employees
- Updates published regularly by Peachtree Software

Requires MS-DOS version 2.0 or higher with 128K of RAM. For use with the IBM® PC, PC XT, PC AT and compatibles. IBM is a registered trademark of International Business Machines.



Order Now! It's a Peach of a Deal with a Money Back Guarantee

Call Now to Order or for a Dealer Near You

1-800-247-3224

In Georgia, call 1-404-564-5800



To Order by Mail, Send Company Check to:

Peachtree Software

4355 Shackelford Road, Dept. PER-03, Norcross, GA 30093

(For More Information Circle 13)

PACKAGE/Company	PRICE	SPREADSHEET COMPATIBILITY	RAM - RESIDENT	MEMORY REQUIRED*	DESCRIPTION AND FEATURES
TEXT EDITING (Cont.)					
Tornado Notes <i>Micro Logic Corp.</i>	\$49.95	Lotus 1-2-3 (all versions), Symphony (all versions), SuperCalc (all versions), MultiPlan, VP Planner, Framework, PFS:Professional Plan	Y	50k	Spreadsheet notepad that doesn't interfere with spreadsheet performance; users enter text into modules consisting of up to 500 windows; they can search for any set of related notes based on any word, phrase, or combination that appears anywhere in a note module; the adjustable windows can be browsed using an arrow key; does not attach notes to specific cells
MISCELLANEOUS					
Above Disk <i>Tele-Ware West</i>	\$99.95	Lotus 1-2-3 release 2.0, Symphony, SuperCalc 4	Y	68k	Allows added memory without an expanded memory board using hard disk to emulate up to eight megabytes of expanded memory
Passkey <i>Fox & Geller</i>	\$49	Lotus 1-2-3 release 1A	Y	256k	Provides comprehensive password protection for 1-2-3 files; guards worksheets by assigning passwords and encrypting data; users call the program up with 1-2-3's commands, set the password for a specific worksheet, then return to 1-2-3
Rescue 1.1 <i>Spectrum Computer Consulting</i>	\$49.95	Lotus 1-2-3 (all versions), Symphony (all versions)	N	128k	Retrieves lost spreadsheets; recovers corrupted 1-2-3 and Symphony files; program retrieves only the useful information and creates a healthy worksheet; features pop-up screens
S.O.S. 1.2 <i>Goldata Computer Services, Inc.</i>	\$49.95	Lotus 1-2-3 release 1A, 2.0; Symphony; SuperCalc; Framework	Y	10k	Helps ensure that spreadsheet data doesn't get lost; saves data in RAM to disk at user-defined intervals; warns when saves should take place; warns when the user does something that could destroy a spreadsheet; can be removed from memory with one keystroke; sets path for saving spreadsheets
SpreadLink <i>Saturn Business Systems</i>	\$150	Lotus 1-2-3 release 1A, 2.0; Symphony; MultiPlan	N	324k	Reformats data files or reports being moved into a spreadsheet, combining file transfer with reformatting
*If the program is RAM resident, "memory required" refers to the actual memory consumed by the software; for non-resident software, this figure refers to the minimum system RAM required to load the program.					

SPREADSHEET ADD-ON COMPANIES

APG Software; 12 Mill Plain Road, Danbury, CT 06811; (203) 794-0396 (For more information, circle 271)

The Binary Workshop; 44 East Main, Suite 202, Champaign, IL, 61820; (217) 359-3400 (For more information, circle 272)

Bridge Software; PO Box 118, New Town Branch, Boston, MA 02258; (617) 527-1585 (For more information, circle 273)

Brown Bag Software; 2105 South Bascom Ave., Campbell, CA 95008; (408) 559-4545 (For more information, circle 274)

Cambridge Software; University Place, Suite 200, Cambridge, MA 02138; (617) 576-5744 (For more information, circle 275)

Clarity Software Corp.; 13276 Research Blvd., Suite 206, Austin, TX 78750; (512) 331-5356 (For more information, circle 276)

Computer Associates International, Inc.; 2195 Fortune Drive, San Jose, CA 95131; (408) 942-1727 (For more information, circle 277)

Coral Software; PO Box 18543, Seattle, WA 98118; (206) 722-8410 (For more information, circle 278)

Cottage Industries; 2024 Swift, Suite 211, North Kansas City, MO 64116; (816) 221-8088 (For more information, circle 279)

Digital Engineering; PO Box 6076, Glendale, AZ 85312-6076; (602) 439-3245 (For more information, circle 280)

Enfin Software Corp.; 6920 Miramar Road, Suite 106-A, San Diego, CA 92121; (619) 549-6606 (For more information, circle 281)

Fox & Geller; 604 Market St., Elmwood Park, NJ 07407; (201) 794-8883 (For more information, circle 282)

Funk Software; 222 Third St., Cambridge, MA 02142; (617) 497-6339 (For more information, circle 283)

General Optimization, Inc.; 2251 North Geneva Terrace, Chicago, IL 60614; (312) 248-7300 or (800) 441-BEST (For more information, circle 284)

Goldata Computer Services, Inc.; 2 Bryn Mawr Ave., Bryn Mawr, PA 19010; (800) 432-3267 (For more information, circle 285)

Intex Solutions, Inc.; 568 Washington St., Wellesley, MA 02181; (617) 431-1063 (For more information, circle 286)

Living Videotext, Inc.; 2432 Charleston Road, Mountain View, CA 94043; (415) 964-6300 (For more information, circle 287)

Lotus Development Corp.; 55 Cambridge Pkwy., Cambridge, MA 02142; (617) 577-8500 (For more information, circle 288)

Macropac International; 19855 Stevens Creek Blvd., Suite 168, Cupertino, CA 95014; (408) 996-8143 (For more information, circle 289)

Micro Logic Corp.; PO Box 174, 100 2nd St., Hackensack, NJ 07602; (201) 342-6518 (For more information, circle 290)

North Edge Software Corp.; 239 Western Ave., Route 22, PO Box 286, Hamilton, MA 01929; (617) 468-7358 or (800) 225-5669 (For more information, circle 291)

Personics Corp.; 2352 Main St., Building #2, Concord, MA 01742; (617) 897-1575 or (800) 445-3311 or in Mass. (800) 447-1196 (For more information, circle 292)

Saturn Business Systems; 420 Lexington Ave., New York, NY 10017; (212) 557-8134 (For more information, circle 293)

SoftCorp; 2340 State Road 580, Clearwater, FL 33575; (813) 799-3984 (For more information, circle 294)

SoftLogic Solutions; 530 Chestnut St., Manchester, NH 03101; (800) 272-9900 or in N.H. (603) 627-9900 (For more information, circle 295)

Solar Systems Software; 8105 Shelter Creek Lane, San Bruno, CA 94066; (415) 952-2375 (For more information, circle 296)

Spectre Technologies, Inc.; 22458 Ventura Blvd., Suite E, Woodland Hills, CA 91364; (818) 716-1655 (For more information, circle 297)

Spectrum Computer Consulting; 9 Burditt Road, North Reading, MA 01864; (617) 664-0337 (For more information, circle 298)

Tele-Ware West; 18023 Sky Park Circle, Suite E2, Irvine, CA 92714; (714) 250-3320 (For more information, circle 299)

Turner Hall Publishing; 10201 Torre Ave., Cupertino, CA 95014; (408) 253-9607 (For more information, circle 300)

Vericomp; 8825 Aero Drive, Suite 210, San Diego, CA 92123; (619) 277-0400 (For more information, circle 301)
(For more information on all the products listed above, circle 302)

PRODUCT INDEX

The following is a list of all products described in this issue's product review, product listing, and buyers guide sections, as well as those advertised products (denoted by ADV) for which more information is available.

SYSTEMS

A*Star Computers, (ADV) Page 51, Circle 23
Baby Blue, Page 167, Circle 105
Business Partner, (ADV) Page 140, Circle 11
Business Partner 286, (ADV) Page 140, Circle 11
CCC-365/AT, Page 167, Circle 106
Deskpro 286, Page 167, Circle 107
Equity III, Page 167, Circle 108
MultiSpeed, (ADV) Page 122, Circle 43
PC-7000A, Page 167, Circle 109
PC-7100, Page 167, Circle 109
The Portable Office, Page 167, Circle 110
Sam 3001, Page 167, Circle 111
SM 286/12, Page 167, Circle 112
3000 HD, (ADV) Page 102, Circle 17
Tandy 102 Portable, (ADV) Page 142, Circle 18
V-Marc, Page 167, Circle 113
Z-148, Page 167, Circle 114
Z-248, Page 167, Circle 115
Z-386, Page 167, Circle 116

PERIPHERALS

■ BOARDS

Apparat Boards, (ADV) Page 184, Circle 202
EGA Wonder, (ADV) Page 165, Circle 77
Graphmaster, Page 168, Circle 124
Hardcard 20, Pages 10-11, Circle 86
JLaser Plus-AT, Page 147, Circle 260
Mothercard, Page 174, Circle 132
MultiSync GB-1, (ADV) Page 151, Circle 38
Oscard, Page 174, Circle 136
QC-PGA, Page 174, Circle 138
Smart EGA, Page 176, Circle 141
Star EGA, Page 176, Circle 142
Star EGA Plus, Page 176, Circle 142
Surprise Boards, (ADV) Page 154, Circle 26
Vega Deluxe, (ADV) Page 124, Circle 58
Zuckerboard Memory Card, (ADV) Page 185, Circle 174
Zuckerboard Monographics Card, (ADV) Page 187, Circle 175
Zuckerboard 20Mb Hard Disk Card, (ADV) Page 189, Circle 173

■ MONITORS

410, (ADV) Page 40, Circle 1
Freedom One Plus, (ADV) Page 66, Circle 36
HX-9E, (ADV) Page 117, Circle 16
HX-12E, (ADV) Page 117, Circle 16
Laserview Display System, Page 172, Circle 128
Model 8CM540, Page 174, Circle 131
MultiSync, (ADV) Page 149, Circle 37
ZVM-1380, Page 176, Circle 149

■ PRINTERS/PLOTTERS

Autoplot, Page 168, Circle 118
ColorMaster, (ADV) Page 98, Circle 68
Diconix 150, (ADV) Page 14, Circle 79
F2010 Compact Laser Printer, Page 168, Circle 120
LaserPower II, Page 172, Circle 127
NB24-15, Page 174, Circle 133
NP-2410, Page 152, Circle 261
NR-15, Page 174, Circle 134
120D, (ADV) Page 110, Circle 3
Omnilaser 2015, Page 58, Circle 262
Panasonic Printers, (ADV) Page 155, Circle 12
Pinwriter P6, (ADV) Page 18, Circle 54
Prowriter C-715 Reliant, Page 148, Circle 251
6408, Page 176, Circle 139
SL-80AI, Page 176, Circle 140

■ DRIVES/TAPE BACKUP

AST-5000, Page 167, Circle 117
Internal Disk Cartridge System, Page 172, Circle 126
Maynstream Plus 20/20, Page 172, Circle 129

Osibak, Page 174, Circle 135
Overdrive 40, Page 174, Circle 137
Qualstar Subsystems, (ADV) Page 172, Circle 204
T-120, Page 176, Circle 145
T-160, Page 176, Circle 145
Totem, Page 176, Circle 146

■ MODEMS

Courier 2400e, (ADV) Page 47, Circle 22
FM-2400E, Page 168, Circle 121
GTX-100R, Page 168, Circle 125
Okitel 1200, (ADV) Page 70, Circle 44
2400VP, Page 176, Circle 144
Worldlink 1200, Page 176, Circle 147
Zoom/Modem PC 2400, Page 176, Circle 148, Page 154, Circle 254

■ MISCELLANEOUS

DataHold, (ADV) Page 57, Circle 57
Datasaver, (ADV) Page 114, Circle 176
Datashow System, Page 162, Circle 252
DDE PC Data Buffer, Page 168, Circle 119
Dot Matrix Cleaning Kit, Page 178, Circle 150
Dots-Perfect, (ADV) Page 114, Circle 154
EC15, Page 178, Circle 226
FX-BM88, Page 168, Circle 122
FX-RS505, Page 168, Circle 123
Idetix, (ADV) Page 174, Circle 186
The Juggler, Page 178, Circle 227
LS-300, (ADV) Page 166, Circle 15
Mac Inker, (ADV) Page 13, Circle 163
Mach IV Joystick, (ADV) Page 179, Circle 90
Microfazer VI, Page 172, Circle 130
Microtek MS-300A, Page 158, Circle 258
MA-100 Modem Adapter, Page 178, Circle 228
PC-DocuMate, (ADV) Page 192, Circle 201
Perma Power Surge Suppressors, (ADV) Page 46, Circle 172
PhotoMetric 200, (ADV) Page 175, Circle 6
Scooter Model SP500M, Page 178, Circle 229
Superchroma, Page 176, Circle 143
Turbo Mouse, Page 178, Circle 230
Xerox Desktop Publishing System, (ADV) Pages 38-39

SOFTWARE

■ WORD PROCESSING

Celebrity, (ADV) Page 180, Circle 72
Electric Pencil, (ADV) Page 153, Circle 61
4Word, (ADV) Page 159, Circle 66
Guide, Page 184, Circle 244
Interword, Page 184, Circle 246
Mindwrite, Page 185, Circle 248
PC-Write, (ADV) Page 15, Circle 190, (ADV) Page 172, Circle 187
XyWrite III, (ADV) Page 16, Circle 179

■ DESKTOP PUBLISHING

Inset 2, Page 164, Circle 255, Page 87, Circle 362
Ventura Publisher, Page 55, Circle 257

■ ACCOUNTING

Accountant's Choice, Page 187, Circle 319
AccountMate, (ADV) Page 185, Circle 161
Act 1, (ADV) Page 157, Circle 60
Act 2, (ADV) Page 157, Circle 60
Cash Drawer, Page 180, Circle 236
CashTrack, (ADV) Page 196, Circle 46
Dac-Easy, (ADV) Page 15, Circle 4
In-House Accountant, (ADV) Page 169, Circle 53
NewViews, (ADV) Page 136, Circle 76
Peachtree Complete Accounting, (ADV) Page 144, Circle 13
Tas-Books, (ADV) Page 27, Circle 2

■ DATA BASES

Contact, Page 180, Circle 237
DBman-Mac, Page 180, Circle 239
Open Access II Database, Page 185, Circle 250
PC Tracker, Page 186, Circle 312

■ SPREADSHEETS

MVP Spreadsheet, Page 185, Circle 249
Open Access II Spreadsheet, Page 185, Circle 310

■ GRAPHICS

Diagraph, (ADV) Page 114, Circle 50

The Enhanced-Speed Autosketch, Page 188, Circle 322
Graph-In-The-Box, Page 87, Circle 361
Picture Perfect, (ADV) Page 114, Circle 50
Project PCB, Page 190, Circle 340

■ COMMUNICATIONS

Crosstalk Mk.4, (ADV) Page 17, Circle 69
DComm>Link, Page 182, Circle 241
Intermail, Page 188, Circle 329
Lotus Express for MCI Mail, Page 189, Circle 332
Relay Gold, Page 87, Circle 364

■ FINANCIAL

ALS18C Financial Consultant, (ADV) Page 180, Circle 198, Page 188, Circle 321
Finance 10, Page 87, Circle 360
TValue, (ADV) Page 178, Circle 195

■ INTEGRATED

Ability, (ADV) Page 100, Circle 52

■ UTILITIES

Above Disk, Page 145, Circle 299
Cambridge Spreadsheet Analyst, Page 139, Circle 275
Cell/Mate, Page 139, Circle 276
Cruise Control, (ADV) Page 19, Circle 151
dAnalyst, Page 180, Circle 238
Datasurf, Page 141, Circle 273
DeskTalk, Page 180, Circle 198, Page 188, Circle 325
Disk Explorer, Page 188, Circle 326
Disk Optimizer, Page 139, Circle 295
Easy Color for Lotus 1-2-3, Page 141, Circle 272
Easy Color for Symphony, Page 141, Circle 272
4Word, Page 143, Circle 300
FileNotes, Page 188, Circle 327
Goal Seeker, Page 139, Circle 274
Goal Solutions, Page 139, Circle 281
Hal, Page 139, Circle 288
Inset 2, Page 141, Circle 271
Keeptrack Plus, Page 189, Circle 330
KeyMac, Page 141, Circle 282
KeyNotes, Page 189, Circle 331
Menu System, Page 143, Circle 279
Micro-VMS, Page 141, Circle 301
Note-It, Page 143, Circle 300
101 Macros for Lotus 1-2-3, Page 141, Circle 289, Page 160, Circle 256, (ADV) Page 33, Circle 8
101 Macros for Symphony, Page 141, Circle 289
Overseer, Page 190, Circle 335
Passkey, Page 145, Circle 282
PCEasy, Page 190, Circle 336
PreCursor, (ADV) Page 44, Circle 184
Printkey, Page 190, Circle 339
Professional Real Estate Analyst, Page 139, Circle 278
Prospect Tracker, Page 192, Circle 341
Quickcode for 1-2-3, Page 143, Circle 282
QuickMac, Page 143, Circle 282
Ram-Resident PrintMerge, (ADV) Page 20, Circle 167
Ready, Page 143, Circle 287, Page 87, Circle 363
Referee, (ADV) Page 53, Circle 45
Rescue, Page 145, Circle 298
Schedule Grafix, Page 141, Circle 280
SideStep, Page 143, Circle 294
Sideways, Page 143, Circle 283
SmartNotes, Page 143, Circle 292
Software Carousel, Page 192, Circle 342
SOS, Page 145, Circle 285
Spellswell, Page 187, Circle 316
Spreadlink, Page 145, Circle 293
The Spreadsheet Auditor, Page 139, Circle 277
SQZ, Page 141, Circle 300, (ADV) Page 184, Circle 194
Templates of Doom, Page 141, Circle 296
Thunder, The Writer's Assistant, Page 150, Circle 253
Timeslips, Page 139, Circle 291
Tornado Notes, Page 145, Circle 290
Turbo Basic, (ADV) Cover 1, Circle 39
Turbo C, (ADV) Page 1, Circle 42
Turbo Pascal, (ADV) Cover 2, Circle 40

(Continued on page 195)



Start Right Here.

Smarter buying decisions start right here by using the Personal Computing Free Information Card, a clearinghouse of information covering the products and services contained in this issue. From full systems, software and peripherals to professional support services.

What's more, you can use the Free Information Card to efficiently gather a comprehensive file of facts, figures and product specs to sort out competing claims, evaluate the available products on the market and make the best purchase.

Because, quite simply, making the wrong buying decision today can all too often prove costly. In Time. Money. And Influence.

Easy as 1-2-3.

1- Circle the appropriate Free Information numbers, referring to the Product Index for additional information.

2- Fill in your name and address in the space provided.

3- Mail this card today—postage is ABSOLUTELY FREE—and receive the valuable information you need, directly from the manufacturers, thanks to Personal Computing . . . where intelligent buying decisions begin. Month after month.

COMPLETE AND MAIL THIS POSTAGE PAID CARD . . . TODAY!

MARCH 1987

Use this card for FREE and FAST information about the products & services listed in this issue. Simply circle the appropriate numbers below.

1	31	61	91	121	151	181	211	241	271	301	331	361	391	421	451	481
2	32	62	92	122	152	182	212	242	272	302	332	362	392	422	452	482
3	33	63	93	123	153	183	213	243	273	303	333	363	393	423	453	483
4	34	64	94	124	154	184	214	244	274	304	334	364	394	424	454	484
5	35	65	95	125	155	185	215	245	275	305	335	365	395	425	455	485
6	36	66	96	126	156	186	216	246	276	306	336	366	396	426	456	486
7	37	67	97	127	157	187	217	247	277	307	337	367	397	427	457	487
8	38	68	98	128	158	188	218	248	278	308	338	368	398	428	458	488
9	39	69	99	129	159	189	219	249	279	309	339	369	399	429	459	489
10	40	70	100	130	160	190	220	250	280	310	340	370	400	430	460	490
11	41	71	101	131	161	191	221	251	281	311	341	371	401	431	461	491
12	42	72	102	132	162	192	222	252	282	312	342	372	402	432	462	492
13	43	73	103	133	163	193	223	253	283	313	343	373	403	433	463	493
14	44	74	104	134	164	194	224	254	284	314	344	374	404	434	464	494
15	45	75	105	135	165	195	225	255	285	315	345	375	405	435	465	495
16	46	76	106	136	166	196	226	256	286	316	346	376	406	436	466	496
17	47	77	107	137	167	197	227	257	287	317	347	377	407	437	467	497
18	48	78	108	138	168	198	228	258	288	318	348	378	408	438	468	498
19	49	79	109	139	169	199	229	259	289	319	349	379	409	439	469	499
20	50	80	110	140	170	200	230	260	290	320	350	380	410	440	470	500
21	51	81	111	141	171	201	231	261	291	321	351	381	411	441	471	501
22	52	82	112	142	172	202	232	262	292	322	352	382	412	442	472	502
23	53	83	113	143	173	203	233	263	293	323	353	383	413	443	473	503
24	54	84	114	144	174	204	234	264	294	324	354	384	414	444	474	504
25	55	85	115	145	175	205	235	265	295	325	355	385	415	445	475	505
26	56	86	116	146	176	206	236	266	296	326	356	386	416	446	476	506
27	57	87	117	147	177	207	237	267	297	327	357	387	417	447	477	507
28	58	88	118	148	178	208	238	268	298	328	358	388	418	448	478	508
29	59	89	119	149	179	209	239	269	299	329	359	389	419	449	479	509
30	60	90	120	150	180	210	240	270	300	330	360	390	420	450	480	510

USE BEFORE MAY 31, 1987

PLEASE PRINT CLEARLY—use only one card per person.

Name _____ Phone No. (____) _____

Company _____ Title _____

Address _____ Apt. _____

City _____ State _____ Zip _____

1-1

MARCH 1987

Use this card for FREE and FAST information about the products & services listed in this issue. Simply circle the appropriate numbers below.

1	31	61	91	121	151	181	211	241	271	301	331	361	391	421	451	481
2	32	62	92	122	152	182	212	242	272	302	332	362	392	422	452	482
3	33	63	93	123	153	183	213	243	273	303	333	363	393	423	453	483
4	34	64	94	124	154	184	214	244	274	304	334	364	394	424	454	484
5	35	65	95	125	155	185	215	245	275	305	335	365	395	425	455	485
6	36	66	96	126	156	186	216	246	276	306	336	366	396	426	456	486
7	37	67	97	127	157	187	217	247	277	307	337	367	397	427	457	487
8	38	68	98	128	158	188	218	248	278	308	338	368	398	428	458	488
9	39	69	99	129	159	189	219	249	279	309	339	369	399	429	459	489
10	40	70	100	130	160	190	220	250	280	310	340	370	400	430	460	490
11	41	71	101	131	161	191	221	251	281	311	341	371	401	431	461	491
12	42	72	102	132	162	192	222	252	282	312	342	372	402	432	462	492
13	43	73	103	133	163	193	223	253	283	313	343	373	403	433	463	493
14	44	74	104	134	164	194	224	254	284	314	344	374	404	434	464	494
15	45	75	105	135	165	195	225	255	285	315	345	375	405	435	465	495
16	46	76	106	136	166	196	226	256	286	316	346	376	406	436	466	496
17	47	77	107	137	167	197	227	257	287	317	347	377	407	437	467	497
18	48	78	108	138	168	198	228	258	288	318	348	378	408	438	468	498
19	49	79	109	139	169	199	229	259	289	319	349	379	409	439	469	499
20	50	80	110	140	170	200	230	260	290	320	350	380	410	440	470	500
21	51	81	111	141	171	201	231	261	291	321	351	381	411	441	471	501
22	52	82	112	142	172	202	232	262	292	322	352	382	412	442	472	502
23	53	83	113	143	173	203	233	263	293	323	353	383	413	443	473	503
24	54	84	114	144	174	204	234	264	294	324	354	384	414	444	474	504
25	55	85	115	145	175	205	235	265	295	325	355	385	415	445	475	505
26	56	86	116	146	176	206	236	266	296	326	356	386	416	446	476	506
27	57	87	117	147	177	207	237	267	297	327	357	387	417	447	477	507
28	58	88	118	148	178	208	238	268	298	328	358	388	418	448	478	508
29	59	89	119	149	179	209	239	269	299	329	359	389	419	449	479	509
30	60	90	120	150	180	210	240	270	300	330	360	390	420	450	480	510

USE BEFORE MAY 31, 1987

PLEASE PRINT CLEARLY—use only one card per person.

Name _____ Phone No. (____) _____

Company _____ Title _____

Address _____ Apt. _____

FREE INFORMATION CARD

Start Right Here.

Smarter buying decisions start right here by using the Personal Computing Free Information Card, a clearinghouse of information covering the products and services contained in this issue. From full systems, software and peripherals to professional support services.

What's more, you can use the Free Information Card to efficiently gather a comprehensive file of facts, figures and product specs to sort out competing claims, evaluate the available products on the market and make the best purchase.

Because, quite simply, making the wrong buying decision today can all too often prove costly. In Time. Money. And Influence.

FREE INFORMATION!

Easy as 1-2-3.

- 1-** Circle the appropriate Free Information numbers, referring to the Product Index for additional information.
- 2-** Fill in your name and address in the space provided.
- 3-** Mail this card today—postage is ABSOLUTELY FREE—and receive the valuable information you need, directly from the manufacturers, thanks to Personal Computing . . . where intelligent buying decisions begin. Month after month.

**COMPLETE AND MAIL THIS
POSTAGE PAID CARD . . . TODAY!**

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 130 DALTON, MA

Postage will be paid by addressee:

**PERSONAL
COMPUTING**

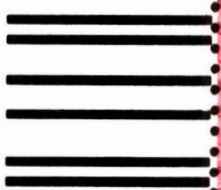
THE MAGAZINE

READER SERVICE

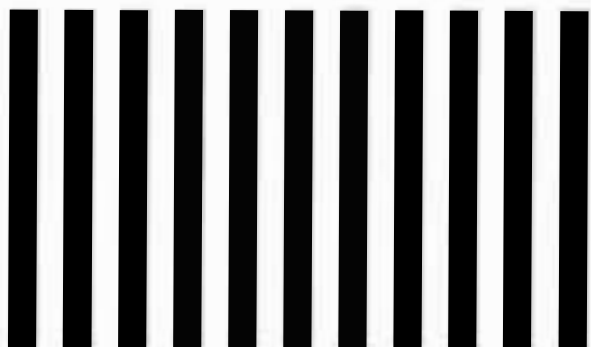
MANAGEMENT DEPARTMENT

P.O. BOX 386

DALTON, MA 01227



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES



BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 130 DALTON, MA

Postage will be paid by addressee:

**PERSONAL
COMPUTING**

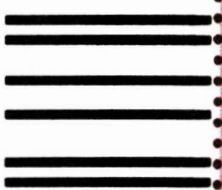
THE MAGAZINE

READER SERVICE

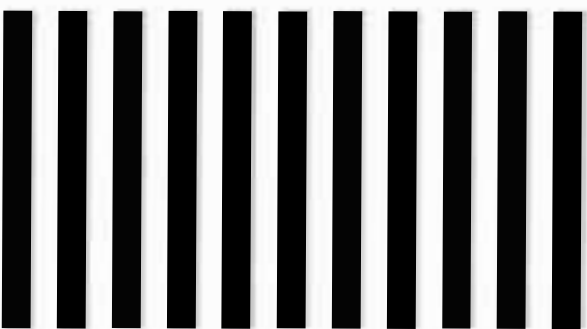
MANAGEMENT DEPARTMENT

P.O. BOX 386

DALTON, MA 01227



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES



A Better Way To Control That Laser

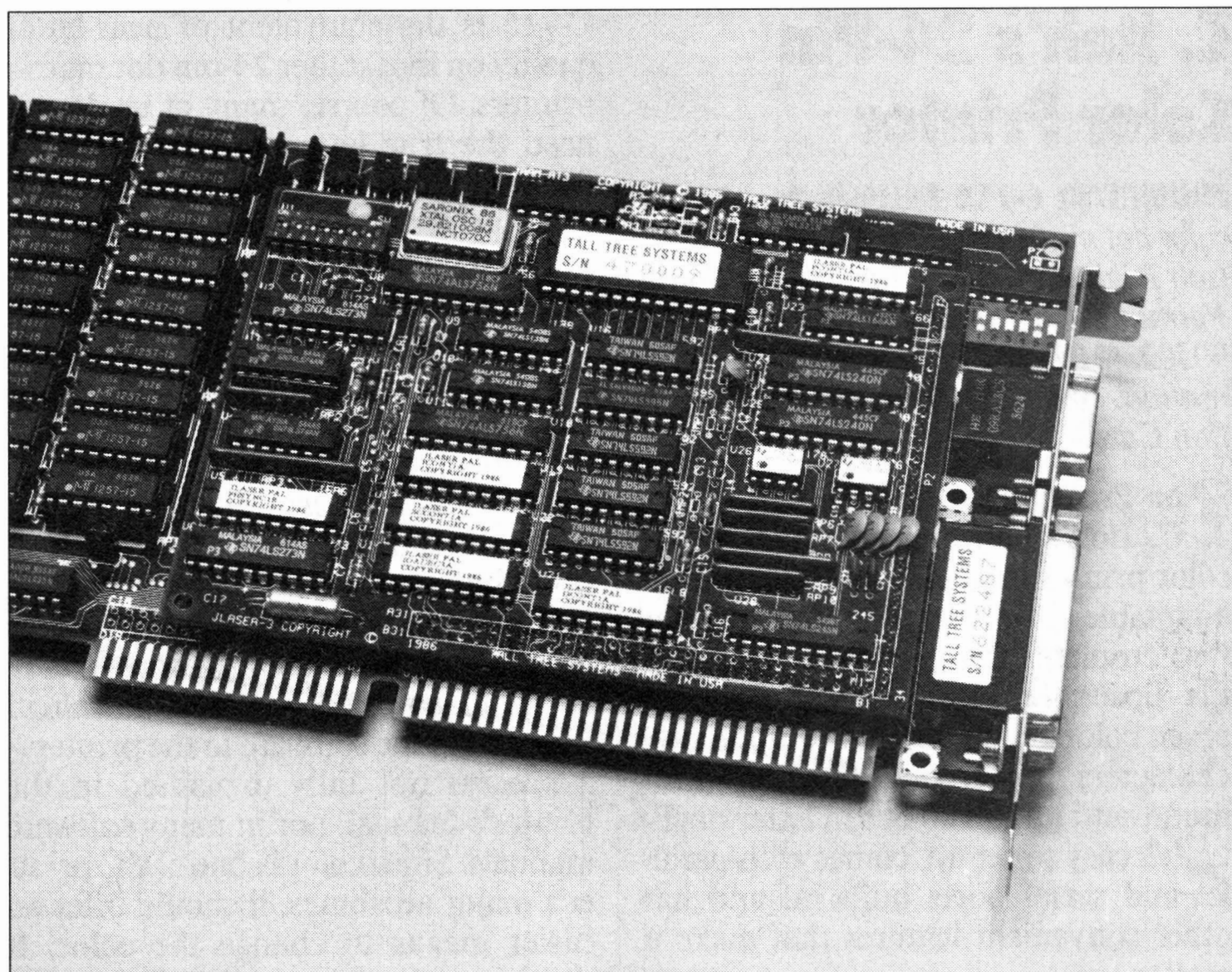
JLASER PLUS-AT is a board that fits into an IBM PC AT-compatible computer; it comes with cables and software; \$699 without memory; \$1,059 with 2Mb, retail; Tall Tree Systems, 2585 East Bayshore Road, Palo Alto, CA 94303; (415) 493-1980. (For more information, circle 260 on the Free Information Card.)

With users of Canon-engine-based laser printers making up the largest installed base of laser printer owners, a healthy upgrade board market has developed to bring their systems up to what has become the acceptable minimum standard for a complete page of graphics—300 dots per inch. As more people start using desktop publishing programs, output of anything less seems much too dotty and jagged to make the grade. And many laser printers slow down agonizingly when doing graphics.

Owners of such Canon-based printers as the Hewlett-Packard LaserJet, LaserJet+, and QMS Kiss who are tired of waiting four minutes or more for a half page graph to lumber out of their lasers, and who resent having to print small to get a dark, solid image, may consider the JLasar a serious alternative to a new laser printer.

The JLasar, a board that holds up to 2Mb of memory, goes into an open slot of an IBM PC AT or compatible computer and connects via cable to a laser printer. While installation in the computer is as easy as that of any board, it will require at least an hour to set up your laser printer properly. You'll also have to add some lines to your system's CONFIG.SYS file. The manual explains how to do this, but if you're still confused, Tall Tree's technical support people can talk you through both the software and hardware installation procedures. They were patient and helpful. The customer pays for the call.

You'll have to lift the lid off the laser, exposing the controller board, and plug a Y-splitter cable provided by Tall Tree into it. This will allow you to run the printer from the JLasar board in your computer, or from the laser's own controller. If you use the laser controller, you can continue to use the laser as you had been through your serial or parallel printer port. You'll still have to go this route when using software that doesn't offer a driver from its printer installation menu for the JLasar.



The JLasar board cables to a laser printer and adds up to 2Mb of RAM in the computer.

The JLasar does not support PostScript, the page description language built into two other Canon-based lasers, the Apple LaserWriter and QMS-PS 800. You'll have to print out the old way to access PostScript's fonts or produce special graphic effects only possible with PostScript. However, you may be pleased with the faster results you achieve by bypassing PostScript.

Programs that support the JLasar include Ventura Publisher, PagePerfect, PageBuilder, ChartMaster, TypeReader, Fancy Fonts, Printrix, Fontrix, LePrint, PC TeX and Hewlett-Packard's Soft Fonts. PC PaintBrush and Halo DPE are two programs that push the JLasar board to its limits, producing resolutions of 600 by 300 dpi. Beyond the better resolution (the LaserJet+ without an upgrade produces only 150 dpi when printing a full page of graphics), there is a noticeable increase in speed with the JLasar. Tall Tree claims pages will be printed up to 50 times faster than before.

There are some other benefits to the JLasar board. Before we installed it, we had 640k in our computer. Upon installation, we found our Lotus 1-2-3 release 2 status screen showing 2Mb of expanded memory available. The board's direct connection to our laser, which had been previously hooked to the computer's serial port, helped free up that very congested port, which at various times also drives an external modem and a mouse. The JLasar board also in-

cludes a port for a scanner, and we were able to plug in a Canon scanner and laser without sacrificing more than one slot in our IBM AT computer.

With this setup, we were able to use the JLasar software to make quick copies from the C> prompt. Typing in "JInput" triggered the scanner to pull through a document; moments later, an acceptable copy popped out of the laser. (You'll also need software like PC PaintBrush to save a scanned image to disk for later use.) Print spooling software is also included.

Tall Tree offers a variation of the JLasar board for owners of IBM PC- and XT-compatibles. With 0k, this version sells for \$599; with 2Mb, \$959.

Owners of Ricoh lasers, meanwhile, can buy a PC- and XT-version with 0k for \$818 and the AT version for \$898. Add \$360 for the 2Mb version in either case. The boards, which work with any printer built on the Ricoh 4080E laser engine, take up a slot and a half.

For the person who bought a laser printer as a silent daisywheel alternative, there is little reason to upgrade. He or she can print text and support all the font cartridges Hewlett-Packard makes, for example, without spending more money on hardware. However, for people who take pride in the quality of their graphics output, and want to significantly increase the speed at which pages are printed, the JLasar offers a real boost to productivity.

—Michael Antonoff

PRODUCT REVIEWS

C. Itoh's 24-Pin Color Printer

PROWRITER C-715 RELIANT is a 24-pin color dot matrix printer; \$1,295 retail. C. Itoh Digital Products, Inc., 19750 South Vermont Ave., Suite 220, Torrance, CA 90502, (213) 327-2110. (For more information, circle 251 on the Free Information Card.)

The ProWriter C-715 Reliant marks C. Itoh's entrance into the 24-pin color printer market. The Reliant is an adaptable 24-pin dot matrix printer that emulates four printers, including the Epson LQ 1000. It can print in seven colors, with a speed of up to 300 characters per second (cps) in draft mode, and up to 100 cps in letter quality. It's easy to set up, comes with parallel and serial ports built in, and has other convenient features that make it easy to use.

The C-715 has a 16-character LCD display panel that enables you to change the characters per inch, or cpi (10, 12, 15, or 16.7—compressed type) from the basic menu. From this menu, you can also change the page length and lines per inch. Through the push-button menu, you can select features like italics and color, and a myriad of other functions. The display panel is a nice alternative to the cumbersome dip switches found on many printers.

Letter quality and quiet mode can be selected from the front panel by pressing one button. If you're used to true letter quality, you may find that the C-715 falls a little short. Letter quality on the

C-715 is the equivalent of near-letter quality on most other 24-pin dot matrix printers. Of course, many of us do not need the true letter quality found on daisywheel printers. The quiet mode is a tad quieter than the regular mode.

The C-715 has a four-color ribbon—three more colors are produced through combinations of these. The ribbon life for color is 1.5 million characters, for black it's 7 million.

Unfortunately, the selection process for color is not easy. Through the extended menu, you can select black or color; but, once you select color, there is no option to select *what* color. This is handled through the software you're using. To get color, you must download codes from the software to the printer—a process not fully explained in the printer's manual, nor in many software manuals. Since color is one of the printer's major attributes, it should offer an easier means to change the color. It should not be the responsibility of the software when a simple solution like building in an extended color selection menu on the printer's front panel would correct the problem.

The tractor feed is a convenient feature. It allows you to load the paper from the top, bottom, or back, and has a push/pull feature that comes in handy for printing multipart forms and labels. This is one of the advantages the C-715 has over the Epson 1000 it emulates—the Epson 1000's tractor feed is not a standard feature. The C-715 printer's auto sheet feeder is optional—available at a cost of \$299 for the single bin, and \$468 for the double bin. You can also use standard or wide-size paper, up to

16 inches. Spreadsheet users, who also can choose condensed type, can pack a lot of data onto the page.

The C-715 can also emulate the Diablo 630, IBM's Proprinter XL, and Toshiba's P351 by means of an identity card. The identity cards are the size of a credit card and slide easily into a slot on the side of the printer. Emulation of the Epson LQ 1000 comes standard on the C-715. If you want emulation of one of the other printers, the cost is \$49.95 for the appropriate card. You can also get optional font cards for \$39.95 apiece. These enable you to print in Letter Gothic and Bold Proportional Space, among other fonts, and have the same easy installation as the identity cards.

You can generate high-resolution color graphics with the C-715, and the quality is excellent—solid graphs in a variety of vivid colors. To produce color graphics with 24-pin quality, you obviously must have a software program that supports your printer. The optional identity cards are a real advantage here. Since many graphics packages support one or more of the printers the C-715 emulates, you'll have support from a variety of programs.

An exceptional feature of the printer is that it comes with a 32k buffer. Typically the buffers on 24-pin printers are either 2k, 4k, 8k, or 16k. The Star Micronics NB-15, for example, offers a 16k buffer, while comparable printers such as Epson's LQ-2500 and Toshiba's P351 have 8k and 4k buffers respectively. With a 32k buffer, you can store a document of as much as 16 pages in the printer. Thus, if you're printing a long document, your computer isn't tied up while the information is being downloaded to the printer. With a 4k buffer, for example, you can only store two pages at a time. So if you have a 16-page document, your computer downloads two pages of information, and those two pages must be printed out before the buffer can accept more data.

The C-715's dimensions are as follows: The width is 24.9 inches; the depth is 14.7 inches; the height is 5.2 inches; and the weight is 37.5 lbs. The printer has a one-year warranty.

The C-715 has a lot to offer. Its near-letter quality, multicolor capability, and front-panel display are a nice combination of features in one unit. The C-715 is a versatile printer, ideal in an office environment in which a multifunction printer is a necessity.

—Heather-Jo Taferner



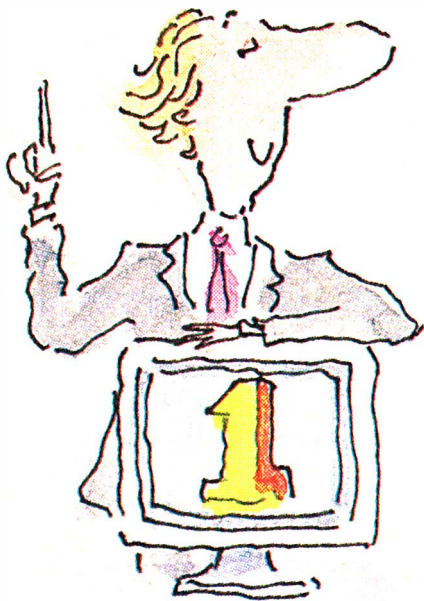
The Reliant uses credit card-size emulation and font cards, and prints in seven colors.

THE POWER OF POSITIVE SYNCING.

THE ONE COLOR MONITOR WITH COMPATIBILITY ACROSS THE BOARD.

The NEC MultiSync™ is the most popular color monitor in its class today. In fact, it's in a class by itself. It's the first color monitor compatible with all three PC graphics boards made by IBM®—PGA, EGA and CGA.

Dollar for dollar, it delivers the best color resolution as well. With clarity and detail limited only by the board in your machine.

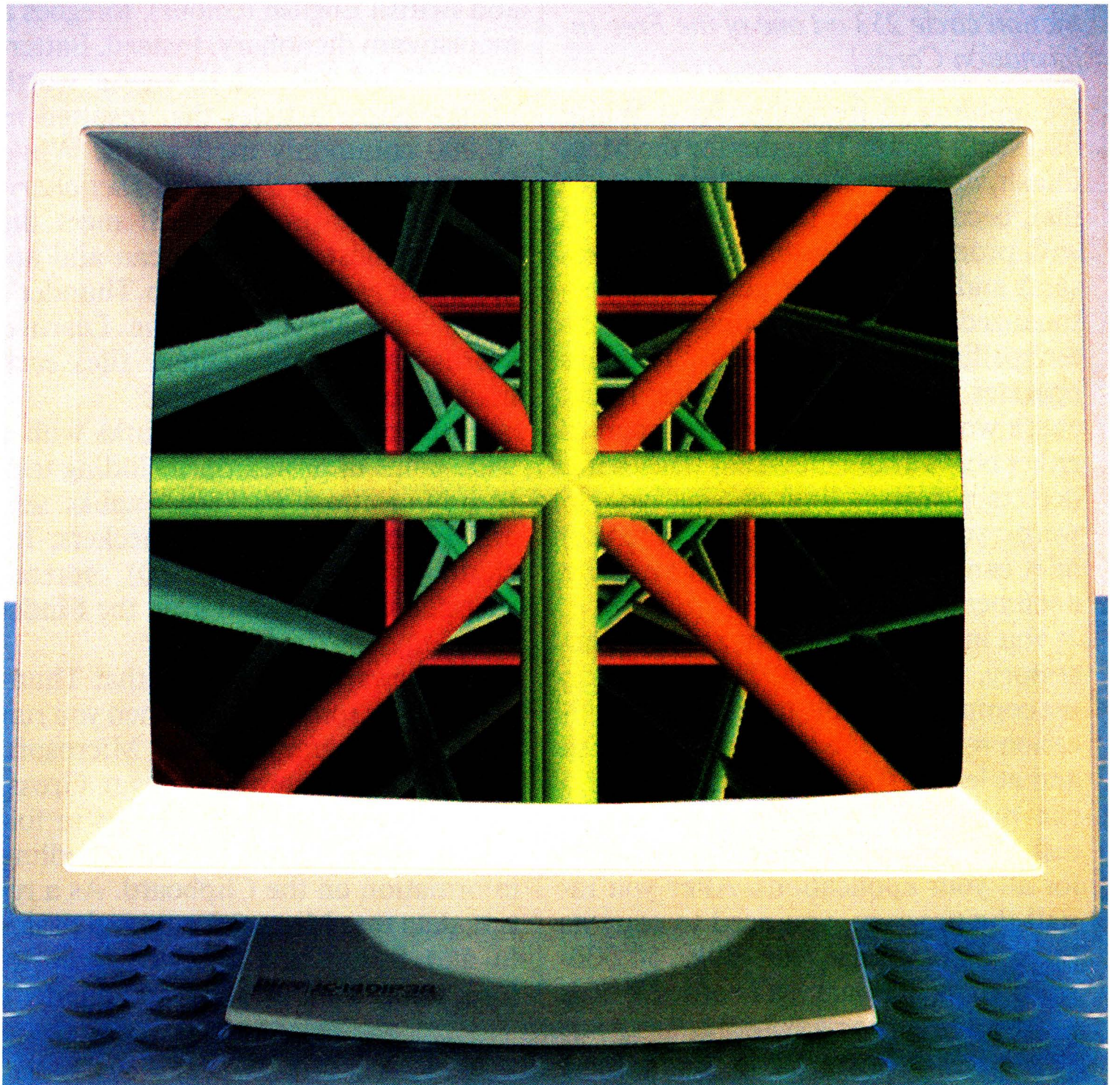


THE INTELLIGENT MONITOR.

NEC technology gives MultiSync circuitry that automatically scans incoming frequencies, then adjusts to anything from 15.75 KHz to 35 KHz. No switches to switch, no instructions from the keyboard. The monitor does it. Automatically.

MultiSync functions in TTL and analog modes. Delivers 7 switchable colors. And its resolution climbs as high as 800 horizontal dots and 560 vertical lines on a 14 inch screen.

C&C Computers and Communications



M U L T I S Y N C™

THE INTELLIGENT CHOICE.

MultiSync is the first monitor you should consider, because it's good enough to be the last monitor you'll ever need.

So whether you're buying your first system, upgrading to color, or moving into professional business graphics, desktop publishing or CAD/CAM, visit your nearest dealer.

See a demonstration of the power of positive syncing. It will give you something great to think about.

For product information and sales assistance, call 1-800-447-4700.

For technical assistance and information, call 1-800-NEC-SOFT.

**NEC Home Electronics (U.S.A.) Inc.
Computer Products Division
1255 Michael Drive
Wood Dale, Illinois 60191.**

(For More Information Circle 37)

NEC

Under A Spell

THUNDER, THE WRITER'S ASSISTANT, version 1.01, is a desk accessory-based spelling checker for the Apple Macintosh (minimum 512k of RAM required, not copy protected); \$49.95 retail or direct order; Batteries Included, 30 Mural St., Richmond Hill, Ontario, Canada L4B 1B5; (416) 881-9941. (For more information circle 253 on one of the Free Information Cards.)

Rumbling in from the Great White North comes Thunder for the Macintosh, an impressive spelling checker that, because of its flexibility (it works with programs other than word processors) and capacity for generating personalized dictionaries, is one of the better spelling checkers around. Thunder operates in either of two modes: It can check words interactively (the program either beeps or the menu bar flashes if it detects a misspelling as you type in words; you decide which marker to use) or it can check a single word or entire document you specify.

You install the program as a desk accessory, using the Font/DA Mover, on the computer's Apple menu. (The application requires 52k on the start-up disk and at least 150k of RAM to open and run properly.) If you're using a hard disk, you can have Thunder available for all your applications. After you install the program, you need to copy its three dictionaries (the 80k, 50,000-word main dictionary, a Learned Words

dictionary that expands user-defined abbreviations, and a user-expandable Supplementary dictionary) to either a start-up, data, or hard disk. You can put the dictionaries within a "folder" subdirectory or on the disk in the external drive—Thunder can access the dictionaries regardless of the location.

The program's list of main words, including those for both American (color) and British English (colour), foregoes a mainstream dictionary. Instead, Batteries Included utilized 10 weeks' worth of newspaper articles that resulted in 50,000 commonly used words. While it's not the *Oxford English Dictionary*, we think the program will meet the needs of most users. You can add approximately 2,000 words to Thunder's main dictionary, while the Learned Words and Supplementary files each hold up to 32,000 characters.

To its credit, Thunder works with a wide range of programs, including telecommunications packages (unlike several other Mac spelling checkers, including MacLightning 2.0), spreadsheets, data bases, and even the Finder itself.

Be forewarned, however, that Thunder displays some glitches when you run it using programs from Microsoft. Thunder's programmer, Evan Gross, says Microsoft has been remiss in following Apple's guidelines for handling information on the Clipboard. As a result, data that Microsoft cuts and pastes to and from the Clipboard loses its formatting. That means that Thunder's

spelling corrections will be inserted as plain text, minus fancy typesyles.

Microsoft programs can also be temperamental when it comes to dealing with desk accessories that add a pull-down menu to the menu bar (as Thunder does). The usual symptom here is garbage to the right of where the menu should be. If you attempt to pull down the menu, the program bombs and you have to reboot.

It's an especially ticklish situation with Thunder, since the program copies a document (or selection) to the Clipboard to check for errors, then pastes any changes back into the document. You can work around this irritation by postponing any formatting in Microsoft Word, for instance, until you've checked the document's spelling.

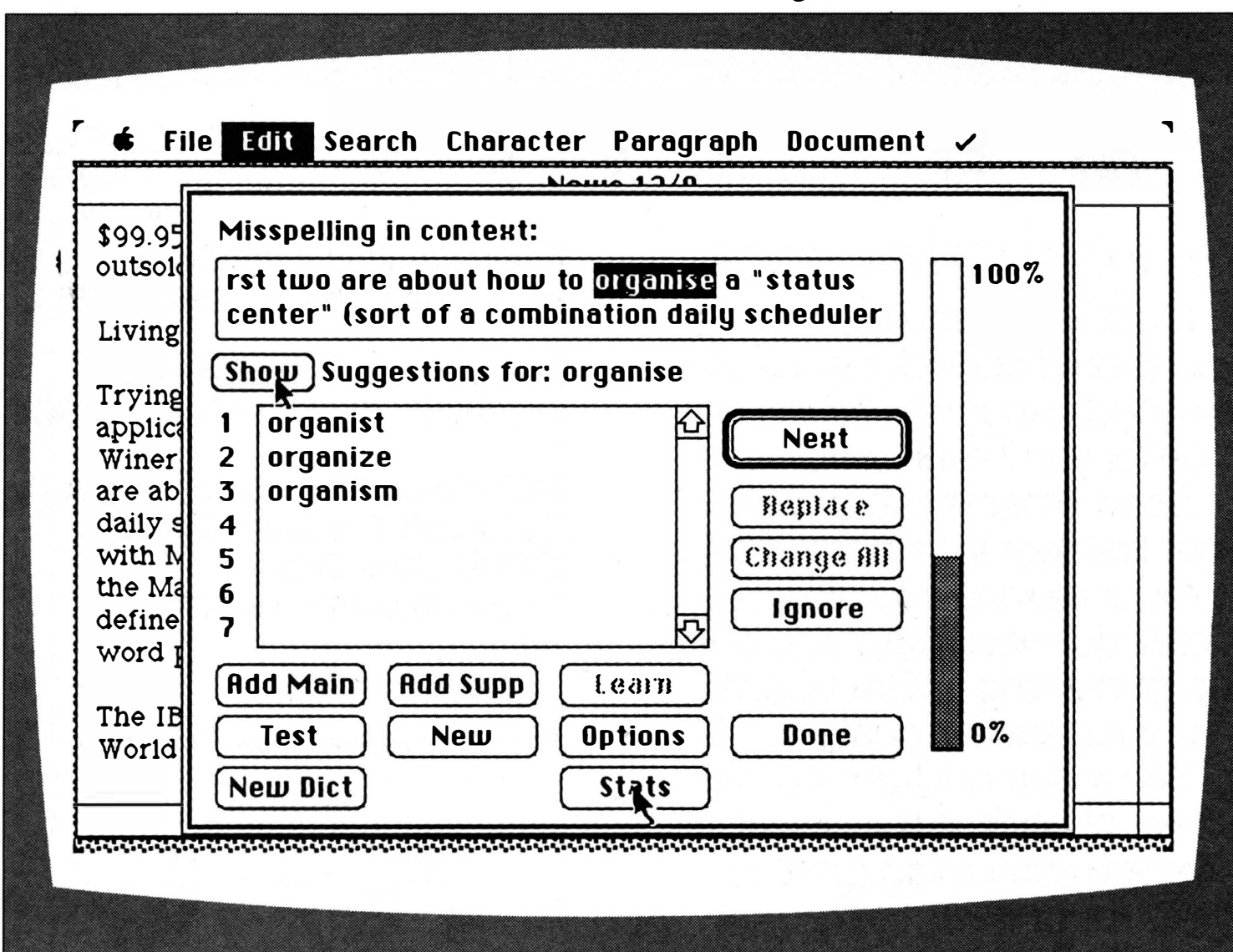
Perhaps the most impressive feature of the program is its ability to invoke nearly every Thunder command directly from the keyboard. This includes toggling interactive checking on and off (Command-/), checking a selection (Command-\), showing dictionary suggestions (Command-W), adding a word to the main dictionary (Command-M), and inserting a word from Thunder's numbered suggestion list (Command-#).

The Learned Words feature lets you "teach" Thunder words and also enter abbreviations that the program automatically expands into phrases of up to 255 characters. For example, you can call up the Learned Words dialog box and enter "vty" in the "learn that all occurrences of:" box and then "very truly yours" in the "should be replaced with" box. Then Thunder enters the phrase into your document every time you type "vty" followed by a space. This feature is similar to the glossary expander in Microsoft Word 1.05.

As an extra bonus, Thunder can provide a list of statistics about your document (number of characters, words, sentences, syllables, etc.) and also analyze the reading level of your work based on Gunning's Fog Index and Flesch's Index. Both will measure your document's readability to provide an idea of the academic level the writing represents.

Also note that Batteries Included uses a novel update policy—customers can download revisions to Thunder from the software aids and add-ons data library of the Macintosh user's section on CompuServe.

—Jack Bell



Thunder displays spelling errors in context and offers a list of suggested alternatives.

SYNC TWICE.

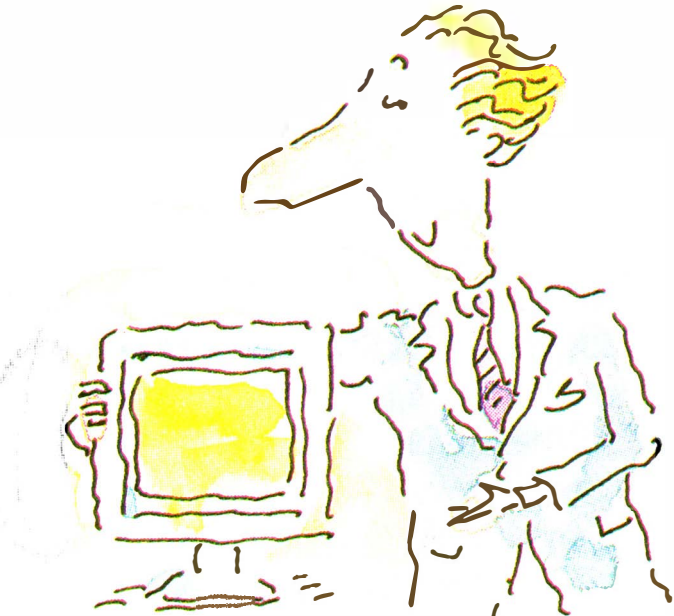
MULTISYNC™ SETS ANOTHER INDUSTRY STANDARD WITH A GRAPHICS BOARD THAT OFFERS PGA RESOLUTION AT AN EGA PRICE.

Another standard from MultiSync™. First, the MultiSync monitor, the original color monitor compatible with CGA, EGA, and PGA graphics adapters.

Now, the new MultiSync GB-1 graphics board.

With a MultiSync monitor, the GB-1 actually takes EGA all the way to PGA resolution — 640 X 480!

Compatibility is no problem. The GB-1 syncs with EGA and CGA color text and graphics, and with MDA and Hercules™ monochrome.



Built-in screen drivers ready for 1-2-3,™ Windows,™ AUTOCAD,™ Dr. Halo II.™

So you're ready for the top spreadsheet, window and CAD/CAM programs in ultra high resolution, without investing in more boards. Even a parallel printer port is included.

Free Dr. Halo II software.

This powerful program provides dramatic color for business graphics. With smoother scrolling, Hardware Zoom. Hardware Viewport. And pixel panning.

Desktop publishing comes true.

When you create graphics for business presentations, your free Dr. Halo II software works like a paint brush. Just pick your palette, and work in the clearest colors. It accommodates a wide assortment of type fonts, too.



MULTISYNC™ COLOR GRAPHICS BOARD

132 column spreadsheets.

You can display up to 132 columns by 44 lines. With text, your screen will show nearly a full page.

\$50 Rebate!

Purchase a MultiSync Color Graphics Board and you'll find a \$50 rebate coupon inside the carton. You can apply it to the price of the MultiSync Color Graphics board or the 14" MultiSync Color Monitor.

See your MultiSync dealer. He has the graphics board and the monitor that will open your eyes. Your computer's too.

For product information and sales assistance, call 1-800-447-4700.

For technical assistance and information, call 1-800-NEC-SOFT.

**NEC Home Electronics (U.S.A.) Inc.
Computer Products Division
1255 Michael Drive
Wood Dale, Illinois 60191.**

(For More Information Circle 38)

NEC

C&C Computers and Communications

MultiSync is a registered trademark of NEC Home Electronics (U.S.A.) Inc. 1-2-3 is a registered trademark of Lotus Development Corp. Windows is a registered trademark of Microsoft Corporation. AUTOCAD is a registered trademark of Autodesk, Inc. Hercules is a registered trademark of Hercules Computer Technologies. Dr. Halo II is a registered trademark of Media Cybernetics, Inc.

PRODUCT REVIEWS

Printer Has Power And Speed

NISSHO NP-2410 is a letter quality dot matrix printer for the IBM PC family of personal computers. It comes with either a parallel or a serial interface; \$1,845 retail. Nissho Information Systems, 10855 Business Center Drive, Cypress, CA 90630; (714) 952-8700. (For more information, circle 261 on the Free Information Card.)

When users get together and talk about technology, the discussion usually focuses on the newest and fastest CPUs or the complex set of hoops that recently released software programs can jump through. If printers come up at all, they're usually cited in the same sentence as "horror story."

While many printers deserve such treatment because of confounding dip switches, unintelligible control codes, and bush-league output, a new era is dawning in the form of 24-pin dot matrix printers. The best now offer true letter quality output, multiple built-in fonts that don't require constant dip switching, and a reason to stop telling horror stories.

Nissho Information Systems' NP-2410 is one of these. At more than \$2,000 fully loaded, the printer isn't cheap. But then neither is the output. It is a letter quality printer with seven fonts, which can be selected by dialing a wheel on the front panel. At 150 characters per second (cps) in its letter quality mode and from 300 to 540 cps in draft

mode, the printer is so fast that people walking by your office are likely to poke their head in to ask what printer you're using.

It's not perfect, of course. No printer is. The rare times you have to get at the dip switches, you'll have to rummage around on the back side. If you don't follow paper-loading directions carefully, there's a paper jam every few pages when you're using the tractor feed (a \$195 option). The built-in buffer is only 6k, about one page. If you want a more realistic 48k buffer so your computer won't be tied up while you're printing a long document, it will cost another \$250. And unless you use the sound cover (which is standard), the NP-2410 can muffle a phone conversation.

The plusses outweigh the minuses, though, and users who need a heavy-duty dot matrix printer would do well to consider the Nissho. "Heavy-duty" means both weight, at more than 38 pounds, and claimed printhead life, at 200 million characters. The ribbon cartridges cost \$15 and are said to last for 5 million characters.

Its seven built-in fonts consist of four draft styles (10, 12, 15, or 18 characters per inch), letter quality courier, letter gothic, and also century proportional. Changing fonts is a simple matter of dialing the appropriate number on the wheel and pushing the reset button. Two more fonts (a cartridge of two fonts costs \$60), can also be chosen from the wheel. Other options include a single-bin sheet feeder for \$295 or a dual-bin that is priced at \$595.

IBM Graphics and Epson LQ-1500

emulation are standard, along with international character sets. When printing text, the characters are in matrixes of 18 by 24 (draft) or 24 by 36 (letter quality). When the machine is printing raster graphics, resolution ranges from 60 by 60 dots per inch to 180 by 360.

In addition to choosing print modes from the control panel on front, users are able to select a variety of other specs, including line spacing, bold or italic printing, and page length. The page-length choices are from 3 to 14 inches and every standard page length in between. Resetting the top of a form is also accomplished from the panel.

The NP-2410 has a 16-inch carriage (which means it doesn't fit easily on a desk), and its minimum width is 4.5 inches. Spreadsheet users especially will appreciate the wide carriage. With 18 characters per inch, you can print up to 238 columns. That's the setting that will produce 540 cps. A more standard 132-column spreadsheet printed at 10 cpi in draft mode moves along at 300 cps. For comparison, Epson's \$1,595 LQ-2500 has speeds of 90 cps in letter quality and 270 cps in draft mode.

It is intended to be used as a bidirectional printer but can be switched to print in one direction. In fact, it automatically switches over to unidirectional printing (at half the normal speed) if the built-in sensor detects a high temperature in the hardware. That means there's little chance that the printer will work itself into a frenzy and stop functioning from overheating.

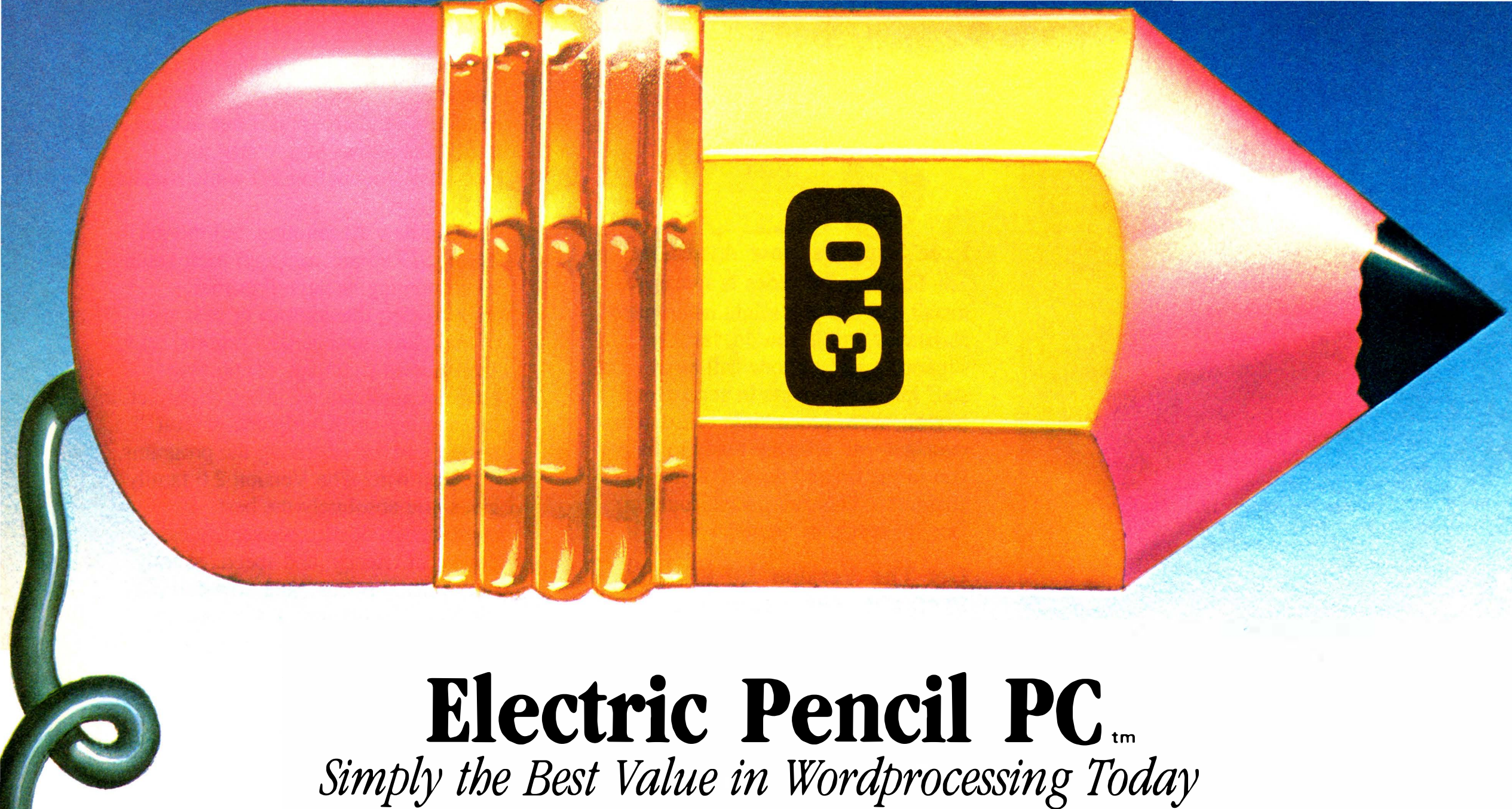
Another nice touch is that if the paper-out indicator comes on during operation, it's still possible to finish printing a document on the last page fed in because pressing the on-line switch prints one line at a time. Another convenience feature is that the form feed button on the front panel works without taking the printer off-line.

The NP-2410 is so user-foolproof that it would make a good departmental printer, especially with the larger print buffer. Its output compares favorably to that of other 24-pin printers, which many companies are choosing as alternatives to the higher capabilities and price of laser printers. The Nissho printer is fast enough to handle a series of long drafts quickly, and the quality is high enough to meet the needs of the most demanding business correspondence. Users who want speed and letter quality for text, graphics, or both, certainly should consider it.

—Sandra R. Reed



Controls of the Nissho NP-2410 letter quality dot matrix printer are on a panel in front.



Electric Pencil PC[™]

Simply the Best Value in Wordprocessing Today

With as many features as wordprocessors selling for 10

times the price, Electric Pencil PC was designed to be sophisticated enough for the professional user yet simple enough for the beginner. Our "Quick Start Guide" will have you writing, editing, and printing in less than 20 minutes. Once you have the basics, any of 500 functions are available with a simple key-stroke. The on-screen help and extensive tutorial windows are like having a manual on disk.

There may be only two methods left for writing: a no. 2 pencil or the power of Electric Pencil PC. You'll be impressed with this full-featured wordprocessing system at a revolutionary price . . . we guarantee it!

- Supports DOS 2.0 (or higher) directory structure
- On screen underlining & bold with monochrome (colors on color monitor)
- Set screen, text, underlined, bold & marker colors
- All prompts in English (no codes or numbers)
- Recover last delete from cut and paste buffer
- Built in disk file recovery
- Definable function keys
- All "wordprocessing keys" are used
- Designed especially for the IBM PC & compatibles
- Definable screen width
- Embedded printer control commands
- Automatic character translation
- Repeat function
- Chain disk files when printing
- Append files in memory
- Include files from disk within text
- Verify option with load & exit
- Centering
- Conditional paging and page numbering
- Remark command in text
- Print any part of text or range of pages
- Over 80 individual on line help windows
- DOS or expanded keyboard buffer
- Toggle between main/alternate text files
- optional ASCII file save/load
- Parallel & serial drivers (RS-232)
- "Pause" command in text
- Single word spell check
- Customize dictionary
- Auto-learn & correct misspellings
- Build "specific" dictionaries
- Auto hyphenation, user defined
- Dvorak, French, German & Spanish keyboard drivers
- Automatic file backup
- Runs on floppy or hard disk
- Keyboard macros
- Automatic key entry files
- Simple 1 or 2 key command structure
- Multiple search & replace functions
- User timed auto-file save
- 270 page 2 color manual
- Split screens (up to 6)
- Right justification
- 3 1/2 in. disk available

☒ PRINT PREVIEW TO SCREEN

☒ FULLY MENU DRIVEN

☒ 100,000 WORD DICTIONARY

☒ EXTENSIVE ON SCREEN TUTORIAL WINDOWS

☒ NOT COPY PROTECTED

☒ WORKS WITH ANY PRINTER

☒ MULTI-LINE HEADERS & FOOTERS

☒ RE-DEFINE ENTIRE KEYBOARD



WINNER OF THE GOLD MEDAL & PROGRAM OF THE YEAR AWARD, CREATIVE COMPUTING MAGAZINE

MONEY BACK GUARANTEE

Electric Pencil PC is unconditionally guaranteed for 30 days (less shipping). There is a \$10.00 restocking fee if the disk envelope seal is broken.

For Texas Orders or Additional Information Call (214) 234-8466. Mail in your order today or, for immediate shipment,

CALL TOLL FREE

1-800-445-9004

\$69.95

*Please Add \$5.00 for Shipping and Handling

25,000 Word Medical Dictionary Optional \$19.95

COD's welcome. Please add an additional \$3.00 COD fee. On all foreign orders, shipping cost is assumed by the buyer.

DEALER INQUIRIES WELCOME



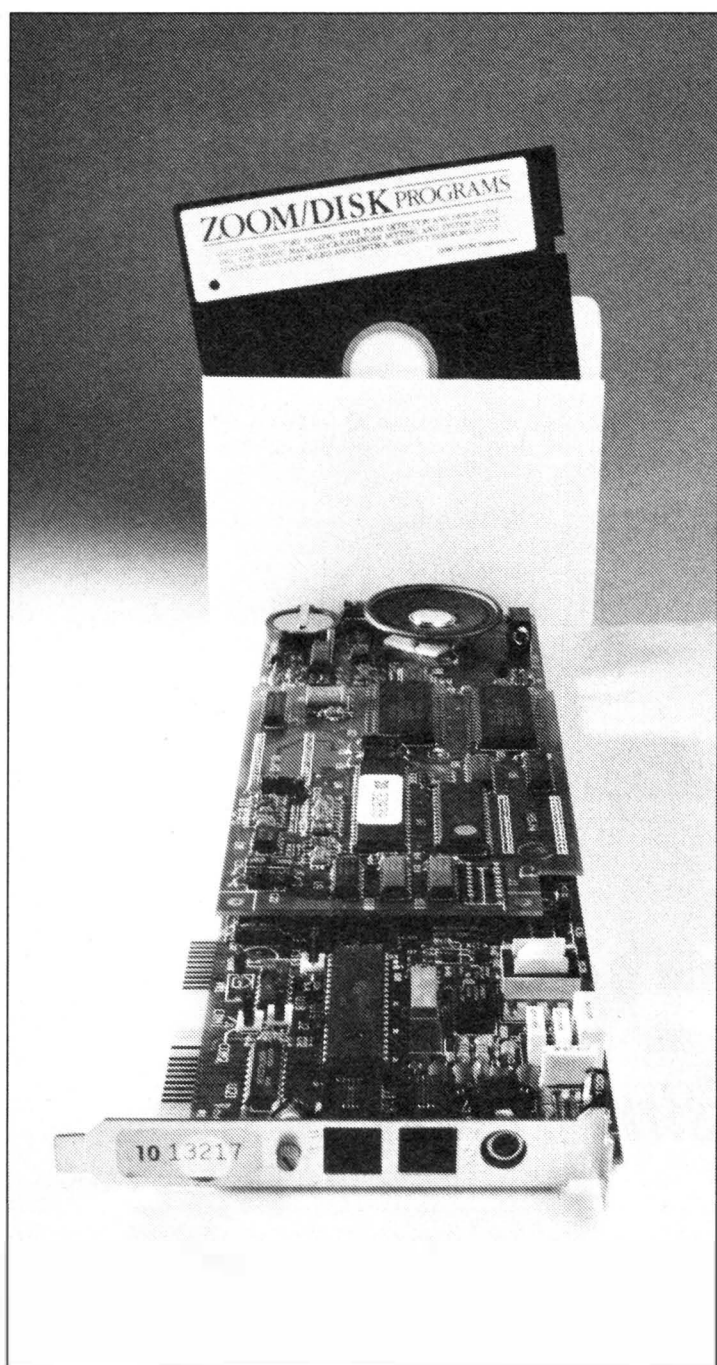
ELECTRIC SOFTWARE CORPORATION

9230 MARKVILLE DR. DALLAS, TEXAS 75243

MINIMUM HARDWARE REQUIREMENTS:

IBM-PC/XT/AT or compatibles and Tandy 1000/1200, 128K memory, one disk drive, PC-DOS, MS-DOS 2.0 or higher. Color or monochrome monitor.

MS-DOS is a trademark of MicroSoft Corp. IBM and PC-DOS 2.0 are registered trademarks of International Business Machine Corp. Tandy is a registered trademark of The Tandy Corp. Electric Pencil PC, Pencil Tutor and PC Proofreader are registered trademarks of Electric Software Corp.



The Zoom/Modem now costs \$349.

The Smooth Zoom/Modem

ZOOM/MODEM PC 2400 XL is a 300/1200/2400 bits-per-second internal, full-card, Hayes-compatible modem for the IBM Personal Computer, PC XT, PC AT, and compatibles; \$349 retail or direct order (Zoom/Disk software, version 1.5, included); Zoom Telephonics, 207 South St., Boston, MA 02111; (800) 631-3116. (For more information, circle 254 on the Free Information Card.)

Zoom. It may seem a trivial name, but there's nothing trite about this thoroughly impressive personal computer telecommunications package—the Zoom/Modem PC 2400 XL by Zoom Telephonics.

Modems from Zoom Telephonics are available in several different configurations. The PC 2400 XL reviewed here includes a clock/calendar with battery (a \$25 value), a 32k electronic mail buffer (\$50) that extends the command line to 255 characters, and a \$25 touch-tone decoder that provides a security feature and offers remote access from a touch-tone phone if your modem is set to answer a call. There's also a \$29 option that extends the product's two-year war-

ranty to five years. Also bear in mind that Zoom Telephonics has cut the prices of its complete modem product line as of February.

The Zoom/Modem is 100 percent Hayes compatible (which means support for the Hayes "AT" command set and other features), delivering capabilities that other manufacturers merely lay a claim to. The Zoom/Modem also supports the Bell 103, Bell 212A and CCIT high-speed data transmission formats. We ran a number of communications packages (Relay Gold, HyperAccess, Smartcom II, and Get) that all had been configured to operate with a Hayes Smartmodem 1200B. All of the programs operated without a single revision to their software configurations other than stepping transmission speed up to 2400 bits per second.

The Hayes 2400B retails for \$739 (\$799 including Smartcom II software), yet lacks many of the cheaper PC 2400 XL's powerful features. These include Demon Dialing of engaged and unanswered numbers; an audio input/output interface that enables the user to connect an external speaker and also receive audio signals (touch-tones); and access to the COM3 and COM4 serial port addresses.

The first step in the installation procedure is running the Zoom/Disk program without the Zoom modem installed inside your computer. This software is not a communications program, but enables you to set the modem to your requirements. The Zsetup file will check to see which COM port (1 or 2) is available. The program found that COM2 in the NCR PC8 used for this evaluation was available. Adjusting the modem for that port meant changing two jumpers on the modem's circuit board, both clearly marked in the manual. You must also flip a dip switch if you want your modem to auto-answer incoming calls. The other program files enable you to call a variety of on-line services such as CompuServe or another computer (Zdial), set the modem's clock/calendar (Zclock), operate the incoming message buffer (Zbuffer), and send commands directly to the modem (Zcommand).

Demon Dialing, the ability to make the modem dial a number continually until a connection is attained, was invented by Zoom Telephonics in 1981. Through the use of tone-detect characters (to instruct the modem to listen for a specific tone) and action characters (to specify action the modem should

take) the Zoom/Modem will Demon Dial any number that you specify, along with the necessary modem commands, on the command line.

It works like this: When so instructed, the modem dials a number 10 times in rapid succession. If unsuccessful, the modem then dials the number five more times during a 10-minute span. The entire process is repeated again after a 10-minute wait if there is still no contact after the 15th call. The Zoom/Modem's Demon Dialing will repeat the suspended 15-call sequence until either the phone call is completed or a 10-hour limit is reached.

There are two basic ways to invoke Demon Dialing from the command line. The first involves the use of the "j" and "{" characters. Entering "j" after the tone-detect character "W" causes the modem to jump back to the beginning of the command line if the modem does not complete the call. Likewise, entering "{" after the tone-detect character will cause the modem to hang up, pause, then jump to the next number in a list to be dialed.

The second method requires entry of the "A=" command (instead of the Hayes AT command), which instructs the Zoom/Modem to Demon Dial the last number the modem has dialed until a carrier signal is detected.

Where the 120-page Zoom/Modem manual is concerned, first impressions aren't lasting impressions. A quick flip-through revealed amateurish drawings and pages upon pages of command codes and other technical material. Don't be put off. This spiral-bound book is a literate, even chatty, presentation of one of the most mystifying aspects of computing today: telecommunications.

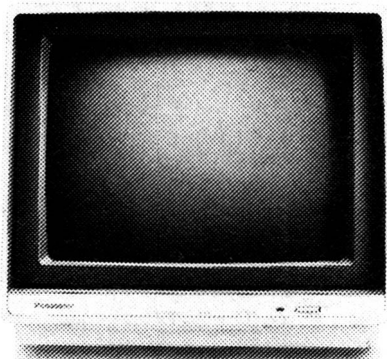
The Zoom manual is broken into three parts—the Owner's Manual, Programmer's Guide, and Appendices—and adeptly knifes through the dense fog often associated with installing a modem and getting it to operate. If there's a gripe here, it's the failure to place the Zoom Telephonics' address and phone number in an easily accessible place. The information is there, to be sure, but why is it necessary to ferret out the phone number on page 23 (in the section dealing with technical support) and the address on page 98 (in a section aimed at developers)? Come on now, this is a product the company can be proud of. There's no reason to hide.

—Jack Bell

HOW TO PUT IT ALL TOGETHER WITHOUT GOING TO PIECES.



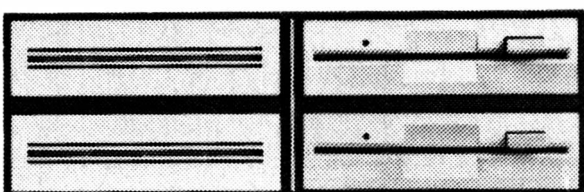
Buying a desktop computer system doesn't have to be confusing. Even with hundreds of monitors, CPUs and printers on the market. Because one name is all you need to know for system components that fit together with the features you need today, and the power to grow with you tomorrow. Panasonic.



YOUR POWERFUL BUSINESS ALLY.

Build your advanced system around the computers designed to answer your most demanding business requirements. The Panasonic® Business Partner™ and Business Partner 286™.

BUILT-IN FLEXIBILITY.



You can configure the Business Partners to your own individual needs. In addition to their built-in disk drives, you

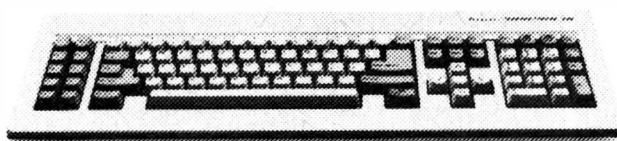
can add a hard disk drive, additional half-height drives—even a magnetic tape drive.

SPEED, PERFORMANCE, POWER, AND FUTURE GROWTH.



Both Business Partners are fast and powerful. The Business Partner 286, with its 80286 processor runs at 6 MHz or 8 MHz and can address up to 15Mb RAM. And as your business grows, so do your Business Partners. They have expansion slots for all the graphics, communications accessories and peripherals you're likely to need.

IMPORTANT DESIGN CONSIDERATIONS.



The deluxe, detachable keyboards have been designed for comfort and ease of use. And we've separated the cursor keys and numeric keys for quick, convenient access.

SOME REASSURING LAST WORDS.

You'll find the Business Partner compatible with the IBM® PC/XT. And the Business Partner 286, with the PC/AT. So you'll be able to run the most popular software. You'll also get compatibility with Panasonic's wide range of quality peripherals. And just as important, both Business Partners are backed with Panasonic's one-year limited warranty.

For more information, mail the coupon and discover how the right Business Partner can make running your business easy.

You'll see: **THE EASIER, THE BETTER.**

Send me information on the Business Partner and Business Partner 286.

Name

Company Name

Address

City State Zip

Write: Panasonic Industrial Company, Computer Products Division, Two Panasonic Way, Secaucus, NJ 07094.

Or call: **1-800-PIC-8086.**

Panasonic
PC37 — Office Automation 

* IBM is a registered trademark of the International Business Machines Corp.

(For More Information Circle 11)

DISK-KING®

Receive 25%

3M

FREE Goods!

BASF

WHY RISK THE UNKNOWN...when you can get premium quality disks from the Leader and Inventor of magnetic media...**for less!!**

★ 100% tested & certified at 65% or higher clipping level ★

★ 10 mil sturdy jacket ★ LIFETIME WARRANTY ★

100 +

5.25"	Reg. Price	Net Price*
SS-DD-RH 48 TPI	.44	.35
DS-DD-48 TPI	.48	.38
DS-DD-RH 48 TPI*	.65	.52
DS-HD-96 TPI for the AT	1.35	1.08
3.5" SS-135 TPI	1.35	1.08
3.5" DS-135 TPI	1.50	1.20

Factory sealed in lots of 25. All 5.25" diskettes are supplied with Tyvek® sleeves, user ID labels, w/p tabs and reinforced hub rings. *Net price reflects 25% FREE goods.

FREE! CX-60 Cassette

& \$2.00 Rebate inside!



SS-DD-RH

DS-DD-RH

.73* 5.25"/48 TPI-10/bx. **.89**

* pre-packaged with 3M's Flip 'n File/15

1.19 3.50"/135 TPI-10/bx. **1.79**

DS-HD-96 TPI for the "AT"-10/bx. **1.89**

DC-100A 11.79 DC-300XL/P 18.65

DC-1000 12.40 DC-600A 20.65

3M H/C Kit 5.99 3M Flip 'n File/15 ... 4.42



Receive 20% FREE Goods
BASF "Boxed Products"

100 +

5.25"	Reg. Price	Net Price*
SS-DD-48 TPI-10/bx.	.82	.68
DS-DD-48 TPI-10/bx.	.88	.73
DS-HD-96 TPI-10/bx.	1.79	1.49
3.50" SS-135 TPI-10/bx.	1.79	1.19
3.50" DS-135 TPI-10/bx.	1.79	1.49

*Net price reflects 20% FREE goods



UNBELIEVABLE PRICES!

Nashua



SS-DD

Qty less than 10 BX. add 10%

DS-DD

.49 5.25"/48 TPI-10/bx. **.52**

1.10 ... 3.50" 135 TPI-10/bx. ... **1.43**

DS-HD 96 TPI for the "AT"-10/bx. **1.45**

**COLOR
DISKETTES**

Receive up to
25% FREE GOODS!
on color diskettes!!

14 different colors

100 +

5.25"	Reg. Price	Net Price*
DS-DD 48 TPI	.69	.55
DS-HD 96 TPI for the "AT"	1.89	1.57
3.50" DS-135 TPI	1.89	1.57

*Price reflects up to 25% FREE goods. Includes Tyvek® sleeves, color-coded ID labels, w/p tabs, and reinforced hub ring. 10 mil sturdy jacket. 75% clipping 100% tested & certified USA made. LIFETIME WARRANTY.

RIBBONS

STORAGE

Epson MX/RX/FX70/80/85	2 35	3M Discover 50	6 99
Epson MX/RX/FX 100/185	3 15	3M D/Defender070 w/key	13 95
Epson LQ1000	4 99	3M Data Defender050	13 95
Epson LQ1500	3 99	Disk Minder II-75	5 99
Okidata Twin Spool	99	Amaray Media Mate 50	8 90
Okidata 182/192/193	3 99	Amaray Micro Mate 3	8 70
Apple Imagewriter	2 39	Plastic Library Case	1 50
IBM Proprinter	3 99	Micro Disk Minder 36	8 70

CALL FOR OUR SUPER LOW PRICES ON COMPUTER TAPES. DISK PACKS Terms: VISA, M/C, AMEX, P.O. COD. Prepaid 2% cash discount. Net 30 Shipping \$3.00/100 or fewer disks. Reduced shipping charges on larger quantities. APO/FPO PR, HI, AK & CN \$8.00/100 or fewer disks. Overseas order call for exact freight charges. Same day shipping.

SATISFACTION GUARANTEED

Toll-Free Order Line:

Telex

Inquiries Line:

1-800-523-9681

9102404712

1-801-942-2273

DISK-COTECH

DISKCO TECHNOLOGIES, INC.

2034 E. 7000 So.

Salt Lake City, Utah 84121

Hours: 8 AM-6 PM (Mtn. Time) - Half day Saturday

(For More Information Circle 189)

PRODUCT REVIEWS

Word Processing File Conversion

WORD FOR WORD version 1.19 is a file conversion program for word processors. It runs on the IBM PC, PC XT, PC AT, and compatibles with 256k and DOS 2.0 or higher; \$149 direct order, volume purchase discounts and site-licensing agreements available; non-copy protected; Mastersoft, Inc., 909 Electric Ave., Suite 202, Seal Beach, CA 90740; (213) 493-2471, (800) 654-5301. (For more information, circle 259 on the Free Information Card.)

An essential component of personal computing has always been freedom of choice. Word for Word enables word processing users in a business environment to work with different programs without sacrificing the ability to exchange the files. This utility program supports two-way exchange between WordStar 3.30 and 3.31, WordPerfect 4.1, MultiMate 3.3, PFS:Write version C, IBM Writing Assistant version 1.0, Volkswriter 3, 1.0, Volkswriter Deluxe 2.2, ASCII, and EBCDIC files.

Users with hard disks can install every single available conversion option, or only some, as they wish. With floppy-based systems, a maximum of three modules at a time can be installed. Storage capacity is a factor, because Word for Word's conversion is a two-step process. The word processing file is converted into an intermediate file, and

then reconverted into the new word processing file. Word for Word performs its conversions speedily and is easy to understand and use.

Word for Word does a good, though not perfect, job of converting files from word processor to word processor. In our tests, the program scored well at maintaining print enhancements and formatting. In moving from WordStar to WordPerfect, for example, it successfully handled such features as boldfacing, underlining, centering, margin settings, and justification, while being unable to convert super- and subscript and double-strike commands. Users will need to do some cleaning up of non-converted features such as these, but we found this to be minimal, particularly when compared to what the program can successfully handle.

Among Word for Word's file conversion options is COM.FORMAT. When you convert one word processing file to COM.FORMAT, you can then transmit it by modem without having the formatting stripped out. It can then be reconverted to the original word processor file, or any of the others that Word for Word works with.

At over \$100, Word for Word is a luxury for anyone who only infrequently needs to swap documents with someone using a different word processor. But in a setting where conversion requirements are extensive, it can deliver consistent value. And in so doing, it helps keep personal computing personal.

—Bob Sillery

To select the SOURCE and TARGET formats, use the CURSOR KEYS (↑,↓,→,←). Press the RETURN key to set each selection, then press the ESCAPE key to begin conversion. Press F1 for HELP. Press F10 to QUIT.

SOURCE

TARGET

⇒ ASCII
COM.Format
Word Star 3.30 & 3.31
Word Perfect 4.1
MultiMate 3.3

←=

ASCII
COM.Format
Word Star 3.30 & 3.31
Word Perfect 4.1
MultiMate 3.3

Word for Word: a utility program that converts files between different word processors.

Accounting at its Best!

Professional Accounting Systems
FOR PC-DOS* & MS-DOS*

**COMPARE AND SAVE
FOR MULTI-USER**



BENEFITS:

CONFORMS TO 3.1 DOS

standards and supports many LANs & Networks.

RECORD LOCKING — true record and file locking gives complete integrity.

VALUE — Benefit for benefit, feature for feature, dollar for dollar, unequalled in the industry.

PERFORMANCE — field tested and proven over 4½ years. Bulletproof!

INTEGRITY — comprehensive audit trails.

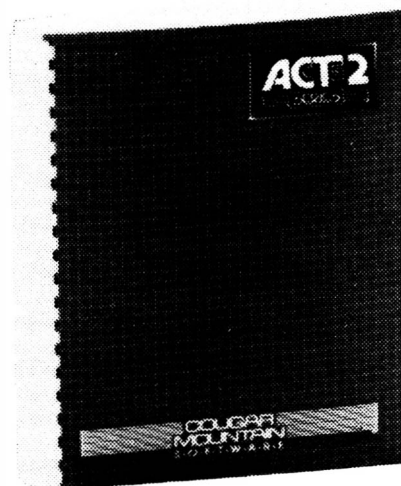
HONESTY — We DO perform all of the features listed.

FLEXIBILITY — Gives you the most flexibility available.

ALL THESE FEATURES
ONLY

\$599.50

+ Shipping & Handling



250 PAGE DOCUMENTATION INCLUDED

CP/M* IS ALSO AVAILABLE

Prices subject to change without notice.

**TRADEMARKS:

IBM-International Business Machines

PC-DOS-IBM MS-DOS-Microsoft

CP/M Digital Research



FOR SINGLE USER

BEST BUY OF THE YEAR — 1986 COMPUTER SHOPPER
EASE OF OPERATION — 2 help messages on screen.

PARTIAL LIST OF FEATURES:

GENERAL FEATURES

Menu driven with 2 help references.
Multi company and report generator.
User can easily install in minutes.
Sample data files included.
Complete audit trail.
All modules can post to multiple profit centers.
Fully integrated with single source entry.
Date sensitive user-defined fiscal calendar.
User defined financial reports.
User can categorize Accounts Receivable, Vendors, Payroll & Inventory by user defined type.
User can design checks, invoices, statements and W-2s.
User defined chart of accounts, account numbers and stock numbers up to 15 alphanumeric.

GENERAL LEDGER

Allows for multi-company ledgers.
Unlimited multi-level accounts for departmentalized reporting.
Allows daily automatic posting to appropriate accounts.
Allows recurring journal entries.
User can process transactions two periods into next year.
Unlimited number of accounts.
Up to 10 year account history.
Allows budgeting.

ACCOUNTS RECEIVABLE

Open invoice and/or balance forward.
Allows unapplied payments and multi-company accounts receivable.
Handles credit limits, collection status and payment discounts.
Supports partial payments and finance charges.
Allows unapplied credit memos.
Up to 5 user-defined aging periods.
Customized text on user-designed statements.
Mailing labels and reports with 7 different sorts.

INVENTORY

Supports LIFO, FIFO, weighted average or standard cost.
Supports markup, margin or list.
Allows up to 4 places to right of decimal for units, cost & price.
Supports any unit of measure.
Supports quantity price breaks.

SALES INVOICING

Supports service or product oriented businesses.
User defined tax tables, including multiple sales taxes.
User defined sales discount tables.
Prints packing slips.
Prints immediate invoices if needed.
Alerts user to customer exceeding credit limit.
Sales History Reports.
Customized text on user-designed invoices.
Automatic updating of inventory daily.
Prints sales journals.
Allows return credit memos.
Interfaces with General Ledger, Accounts Receivable & Inventory.

ACCOUNTS PAYABLE

Can post to 200 general ledger expense accounts per invoice.
Automatically updates inventory and general ledger daily.
Automatically prepares payments.
Supports partial payments and handwritten checks.
Supports prepaid expenses and future liabilities.
Processes credit and debit memos.
Computes discounts and records discounts taken.

PAYROLL

Generates automatic payroll.
Automatically posts to General Ledger and Accounts Payable.
Provides up to 15 user-defined rates.
Allows post facto payroll.
Allows distribution of payroll expenses to user-defined departments.
Benefits and deductions are calculated on fixed amounts, hourly amounts, percentage of gross or variable.
Allows additions to gross which may be taxable, nontaxable, or partially taxed.
Handles sick leave and vacations.
All tax tables easily updated by the user.
Handles payroll draws, per diem pay, contract and piece work, hourly and salary.
Handles tip accounting.
Prints 941As and W-2s.

HARDWARE REQUIREMENTS

IBM PC* or compatible.
HARD DISK REQUIRED.

EXPANDABLE — single user is upward expandable to multi-user with data files automatically transportable. NO DEADEND FOR GROWTH.

POWERFUL — handles multi-company and/or multi-departments.

PRIDE — Yes, we are immensely proud of the capabilities of our software.

SECURITY — 2 password levels for each module.

SUPPORT — excellent company support available.

ALL THESE FEATURES
ONLY

\$99.50

+ Shipping & Handling



250 PAGE DOCUMENTATION INCLUDED

Our guarantee is your assurance of quality!

UNCONDITIONAL 30 DAY MONEY BACK GUARANTEE

We guarantee the software to perform all of the features listed or money will be returned within 30 days.
Restocking fee applicable.

GUARANTEE applicable on all products bought directly from COUGAR MOUNTAIN SOFTWARE.

SITE LICENSES AVAILABLE.

To order CALL

(800) 344-2540

8:00 - 5:00 MST

Monday - Friday

**COUGAR
MOUNTAIN**
S.O.F.T.W.A.R.E.

2609 Kootenai, Box 6886, Boise, ID 83707, 208-344-2540

(For More Information Circle 60)

PRODUCT REVIEWS

Scanning Images Into Your Computer

MICROTEK MS-300A connects to the Apple Macintosh with at least 512k; external drive or hard disk recommended; \$2,495 retail or direct order (includes scanning software and interface cable); Microtek Lab, Inc., 16901 South Western Ave., Gardena, CA 90247; (213) 321-2121. (Circle 258 on one of the Free Information Cards.)

The explosion in desktop publishing during the past year has sent hardware manufacturers dashing to release products that can fully exploit personal computing's latest cash cow.

Near the top of the desktop publishing pyramid rests Microtek Lab, Inc. (a division of Microtek International of Taiwan), maker of the MS-300A image scanner. In addition to marketing the product for Apple's Macintosh Plus (and other systems), the company is the original equipment manufacturer (OEM) of scanners sold by Abaton, AST, Gestetner, Packard Bell, and A.B. Dick. These value-added resellers, however, often sell the scanner with their own software programs added. For instance, Abaton opted to write its own scanning application (C-Scan), while AST stuck with Microtek's program.

In essence, an image scanner enables

the user of a Mac Plus and LaserWriter printer to feed graphics (photographs and other artwork), one by one through the scanner, which digitizes the information. The user is then able to save the image to disk. The graphic then can be transferred to a page makeup program, such as Aldus' PageMaker for example, where it can be resized or cropped, inserted in a newsletter or business report, and printed with the LaserWriter.

The 19-pound MS-300A desktop scanner, which is capable of scanning images at 300 by 300 dots per inch, measures nearly 15 inches wide, 5 inches high, and 18 inches deep. Single-sheet documents (a maximum 8.5 by 14 inches) can be fed through the scanner's roller or else users can purchase an optional multisheet (maximum 50 pages) auto-feeder (\$295). The unit scans an 8.5- by 11-inch document in about 10 seconds. The scanner attaches to the Mac Plus through one of the computer's two 9-pin serial ports with an interface cable that is included with the unit.

The hardware unit is truly the foundation from which the VersaScan software (not copy protected) erects the elements of the scanned image. Version 2.07 was used for this review running on Apple Computer's Hard Disk-20SC. When scanning and then saving an image, consider that your storage area, even on a high-capacity hard disk, could be quickly exhausted. For instance, a

small snapshot occupied 130k, so it's definitely a good idea to archive your saved scans to floppy disks. Also, when transferring scanned images into a PageMaker document and then printing, it's necessary to make sure that PageMaker has access to the original scanned image.

That said, the VersaScan software offers impressive flexibility, including the scanning of both line art (black-and-white documents) and halftones (photographs and other artworks that are composed of varying shades of gray) at a variety of scaling percentages.

Upon entering VersaScan, you're presented with a Welcome screen from which you'll most likely want to make the Change Scanning Parameters selection. The next screen is really the place where you're able to manually customize your scanning parameters. It's important to remember to place the document you want to scan in the middle of the unit's paper-feed mechanism if the document is less than 8.5 inches wide. That's because the unit's sensing device is in the center of the MS-300A.

The Mode menu enables you to select either line art or halftone modes. When using the halftone mode, you can make 12 further selections to control the overall darkness (grain sizes) of the image. You then have a choice of 14 increments for both brightness and contrast.

After an image is scanned, you can perform basic editing tasks using Fat Bits, similar to the feature found in Apple's MacPaint program. You also have the option of saving the image as a MacPaint file if you want to edit it in that program. Scanned images can be saved in any of five formats; how they are saved depends on how you intend to use them.

For example, images to be printed directly to a LaserWriter should be saved in the PostScript format. The Non-compressed format is the best selection if you intend to use an image in a PageMaker document. It's important to set your scanning parameters for reduction or enlargement *before* the image is scanned.

By the time this review is published, Microtek will have released a number of new products for the MS-300A. These include an enhanced version of its VersaScan software (VersaScan Plus), optical character recognition software (MacOCR), and a connection to the Mac's high-speed Small Computer Systems Interface (SCSI) port.

—Jack Bell



The MS-300A image scanner digitizes photos and line art for use in Mac applications.

A funny thing happened on John Hart's first day at his computer...



he got results.

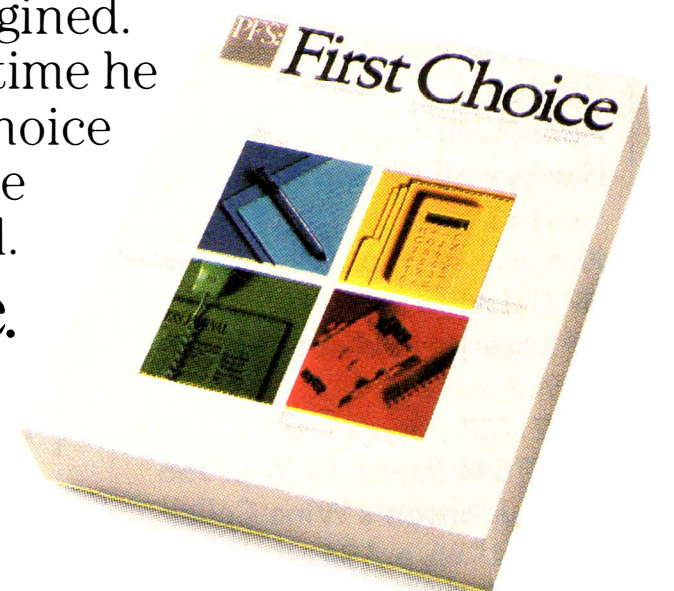
John Hart was already convinced his new computer could make life easier. What worried John was that it would take him weeks, maybe months to get the most out of a software program.

PFS®: First Choice changed all that. The first thing John noticed was the instruction manual. It wasn't huge and complicated like other software programs. In fact, First Choice let him get started immediately.

Then John found out First Choice was one integrated program that could handle all his business needs. A versatile word processor with spell checking, flexible file management, a powerful spreadsheet program, and resourceful electronic communications were right at his fingertips. And they all worked faster and more efficiently than he ever imagined.

By the end of the day, John Hart discovered that in the time he had set aside for his first lesson, he had already used First Choice to write a dozen error-free letters, create customer files, make sales calculations, and check the Dow® Jones News/Retrieval.

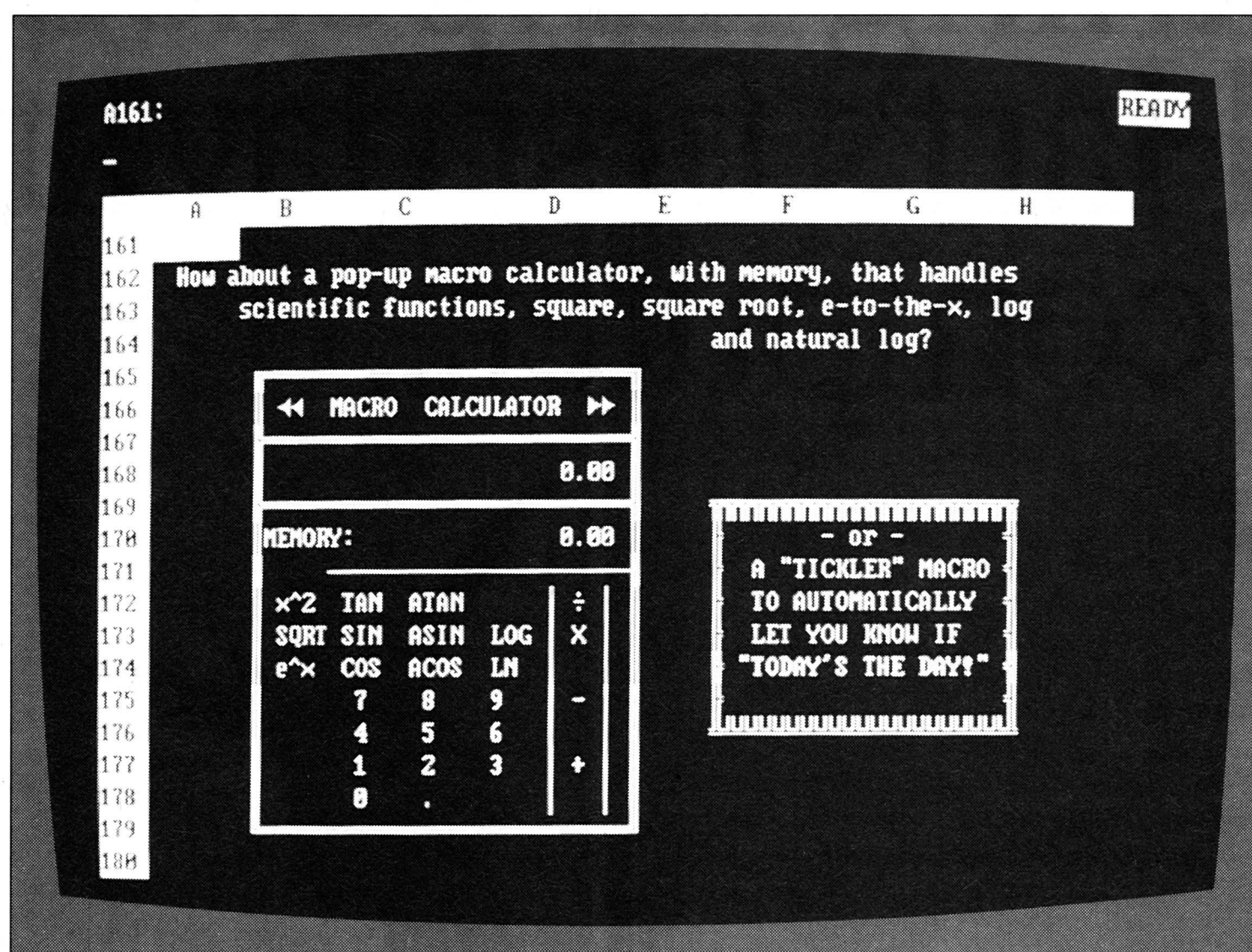
He can hardly wait for tomorrow. **PFS: First Choice.**
No Experience Required.



Special Introductory Offer. Save \$50, limited time only.

Ask your nearest dealer for a demonstration.

© Software Publishing Corp., Mountain View, CA. Works on IBM and compatible computers only.



Many of Macropac's 101 Macros for Lotus 1-2-3 can be imported into worksheets.

Mastering Macros In Lotus 1-2-3

101 MACROS FOR LOTUS 1-2-3 is a collection of general-purpose macros for use with Lotus 1-2-3 release 1A or 2.0; runs on the IBM PC family and compatible computers; versions also available for the DEC Rainbow and Hewlett-Packard 150; non-copy protected; \$69.95 retail; Macropac International, 19855 Stevens Creek Blvd., Suite 168, Cupertino, CA 95014; (408) 996-8143. (For more information, circle 256 on the Free Information Card.)

The difference between merely using Lotus 1-2-3 and, on the other hand, actually mastering it, is roughly the difference between shooting a hole in one at miniature golf and shooting one at Pebble Beach. And just as an entire industry exists for golfers who want to become better, part of the personal computer industry exists solely to help 1-2-3 users get more from their spreadsheets.

As with golf, it can cost a lot to learn about 1-2-3. An eight-hour class that covers only beginning concepts can cost more than the program itself. But there are plenty of alternatives if you would rather spend time than a lot of money to improve basic skills.

At \$70, 101 Macros for Lotus 1-2-3 is one of those cost-effective alternatives. There's nothing fancy about the program or the packaging. It is a collection of macros that do everything from re-

calculating a single cell to exchanging data from a row into a column or vice versa. The program consists of a collection of .WKS files compatible with release 1A. Version 2.0 will automatically convert them into the .WK1 files it requires. Four of the files contain macros that can be loaded into existing worksheets. Other files on the disk do such things as list all of the macros, provide general tips for using 1-2-3, help users write their own macros, or offer a word processing template for both writing and printing memos.

The four working files have macros labeled alphabetically, all of them in a format that can be imported using the /File, Combine, Copy, and Named Range commands. Since range names are lost during the process, the user has to name them again before they can be activated. That's probably for the best, because Macropac obviously stretched to name a few. In the "Y" list, there's a macro entitled "X" for "Xfr (Transfer) Absolute Value." Renaming that "transfer" will probably clarify things.

The biggest challenge in using 101 Macros for Lotus 1-2-3 may be deciding which of the macros to use. Because some are similar, it's worth the time to read through the detailed descriptions in the manual before importing macros. In the YMAC file, for instance, the "I" macro inserts a blank row while copying the format from the row above. In the ZMAC file, the "I" macro inserts a row while copying the

data and format from the row above. Some of the macros merely save keystrokes; for example, allowing you to type Alt-F rather than /File, Combine, Copy, Entire to combine worksheets. Others perform functions that are possible, but difficult, in 1-2-3, such as inserting column letters and row numbers into a printout without affecting the worksheet itself.

Users who do take time to read through the manual rather than just scrolling through the shortened descriptions on the disk are also likely to come up with ideas for creating their own macros or reach the conclusion that some of them would be even more useful customized. The design of 101 Macros for Lotus 1-2-3 makes it possible to experiment or use the mini-programs as building blocks for other macros without destroying the original.

Because the program was originally written to work with release 1A, a few of the macros duplicate menu features built into release 2.0. Thus, 1A users will be interested in the macro that adds password protection to worksheets, while 2.0 users will find the same capability built in. Although the macros are in .WKS files for 1A compatibility, Macropac says the program was revised, not just repackaged, after the release of version 2.0.

In addition to offering a full 101 macros, this program helps demystify 1-2-3 macros in general. The manual contains a clear explanation of how to create and use macros. It cautions, for instance, that users need to be careful about inserting and deleting rows and columns once they've written macros. If you have a macro in cells AB2 through AZ7 and then delete row 3, your macro is a goner because whatever was in AB3 through AZ3 is deleted, too. Macropac recommends reserving the top of a worksheet for macros, so you'll always be aware of them. And the more aware users are of macros, the more likely they are to use them. After a while, you may begin to wonder how you got along without them.

101 Macros for Lotus 1-2-3 isn't really for users who can handle macros with ease. Still, such people may find a gem or two that will help them hit even more holes in one. The program is a good bet, though, for users looking for an edge, but who haven't got quite enough experience to get it on their own. It's like the caddy who always knows which wedge will get you onto the green.

—Sandra R. Reed

Rolodex® Software

Desktop management systems from the company that started it all.

Trademark
Software



COMPUCARD BY ROLODEX™

COMPUTERIZED CARD FILING SYSTEM

With CompuCard by Rolodex, card sets can be created, updated, edited and duplicated fast and easy to improve office productivity and organization as card filing is simplified.

CompuCard Software Program and Documentation Manual are available for IBM®/PC (CSM-I) or Apple® IIe (CSM-A) at \$49.95. They are also available complete with VIP24C Special file and 500 Rolodex Brand Continuous Form Cards, 2¼ x 4" at \$68.50 (CC500-I for IBM and CC500-A for Apple). CompuCard features include: ☐ **Free-form card format with up to 450 characters per 2¼ x 4" card** ☐ Rapid printing ☐ Full-screen editing commands ☐ Date stamping for each entry ☐ Dual indexing ☐ Flexible select code system.

LABEL EXPRESS BY ROLODEX™

Label and List Management Software

Label Express makes it easy to create labels, locate and update mailing lists, address envelopes, print name badges or Rolodex Brand Continuous Form Cards. Label Express by Rolodex. It keeps you in touch with people.

Label Express software is available for IBM/PC (LSM-I) and Apple IIe (LSM-A) computers, at \$49.95 each. Its powerful features include: ☐ **Creating your own label formats, up to 180 characters on five lines.** ☐ Full-screen editing with popular, word processing commands ☐ Immediate indexing for each new entry ☐ Extensive and time-saving search features ☐ Full combine/merge capability ☐ Customized printing up to 999 copies.

ROLODEX CORPORATION

245 Secaucus Road, Secaucus, N.J. 07094

An **Insilco** Company

(For More Information Circle 28)

IBM/PC is a registered trademark of International Business Machines Corporation; Apple IIe is a registered trademark of Apple Computer, Inc.

PRODUCT REVIEWS

Slideless Slide Show For Groups

DATASHOW SYSTEM is an electronic transparency system for displaying computer images through an overhead projector. It consists of a "projection pad," Sayett Technologies' Showmaker software, and a remote control for use with the software. It works with an IBM PC or compatible with an IBM Color Graphics Adapter, Enhanced Graphics Adapter (in CGA mode), or compatible, and a transmissive overhead projector; \$1,270 retail; Eastman Kodak Co., Motion Picture and Audiovisual Products Division, 343 State St., Rochester, NY 14650; (800) 44-KODAK. (For more information, circle 252 on one of the Free Information Cards.)

Datashow provides an easy way of showing slide-like presentations without having to make 35mm slides or buy a special projection system to hook up to your computer. In addition, anything that you do on your computer can be projected as you are doing it, a handy feature for conducting computer training sessions.

The lightweight device is a liquid crystal display mounted on a flat "projection pad" that you place over the transparency tray in an overhead projector, a device many offices already have. You then plug the pad into a per-

sonal computer's RGB display port, and in turn, connect the computer monitor to the receptacle provided on the pad's cable. Your computer must contain a CGA or EGA (in CGA mode) board. It does not work with a monochrome system. The only other things you'll need are a projection screen or white wall, and an audience.

The projected image is clear, right down to the individual pixels that make up text characters. When you use the page down key, the result is a fade-out of the previous screen and fade-in of the next. Now the bad news: It only projects black and white. Actually, the image has a blue tint due to the color of the liquid crystal. The contrast is good, however, as long as the room lighting is turned off or dimmed.

If you are preparing graphs and pie charts from a color program, you should be aware of which colors will project as black and which white. Green, cyan, brown, and white will all come across as white; and magenta, red, blue, and black as black, so don't make two consecutive pieces of your pie chart red and blue, or green and brown.

The Showmaker software is included, with an accompanying remote control device. This package, made by Sayett Technology for Eastman Kodak, has three parts: one memory-resident section to enable you to capture screens from application programs; one section that enables you to organize the screens

to be presented in any order; and one part that simply plays the shows you've created. Showmaker requires a total of 256k, while the memory-resident portion takes up only 18k.

Showmaker, which is not copy protected, can be used without consulting the manual. After you've captured the screens you wish to use in your presentation, the Presentation Editor portion guides you through the process of arranging them. A list of commands is at your disposal when you strike F1, the help key.

With this program, you can define how long you wish each screen to stay up before going on to the next one; you can specify slow or fast blinking or "reverse video" (changing the background color from light to dark or vice versa) for any screen; and you can "split" a screen, showing two screen images simultaneously for comparison purposes. The remote control lets you choose any screen out of sequence; freeze a screen; and move the image up, down, left or right. By creating a show with the software and controlling the visuals with the remote device, you can display a presentation that runs automatically and won't cause you to do a lot of fumbling. The Datashow and remote control also work with Brightbill Roberts' Show Partner software, a similar but more elaborate program.

Kodak also plans to release a read-only floppy disk player in the near future that has a footprint a little bit bigger than a 5.25-inch disk and will play back a preprogrammed show. This way, you can pack up your Datashow and portable disk player with your presentation disks, and only have to worry about the availability of an overhead projector at your destination.

For live training sessions, the system is most efficient. A word processing or spreadsheet instructor can accommodate a classroom of students rather than one or two people peering over his or her shoulder.

Though color is sacrificed and the quality isn't quite as sharp as images projected through overhead transparencies created with a good laser printer, Datashow is a relatively inexpensive and quick alternative to other media. And unlike slides or transparencies, which must be created in advance, Datashow gives you the option to present a computing session live from the keyboard. Thus, you can adjust your visuals to audience needs on the fly.

—Stephanie Makrias



Datashow sits on an overhead projector's transparency tray; remote control is included.

Maximize Your Potential

Increase Your Productivity —
at Home or on the Job.

Personal Computer Book Club puts you on line with the most up-to-date computer publications available from all the leading publishers. Each selection meets exacting PCBC standards and is chosen for its easy-to-read style, easy-to-use format, and practical value. PCBC books give you the hands-on experience you need to increase your computer skills and knowledge.

Computer Professionals Guide You

Our advisory board of working computer professionals ensures you see only the finest computer books designed to stand the test of time.

Books Described by Level of Sophistication

From novice to advanced programmer, you'll know the degree of difficulty each book represents — and the level of computer literacy needed to use the book most effectively.

Dramatic Savings

You save up to \$36.00 on the introductory book, and keep saving 20-30% on every book thereafter.

PCBC Guarantees Convenient, Reliable Service

Next time you sit down behind your PC make every minute count! PCBC books are designed to give you the expertise you need to get more work (or play!) out of your PC.

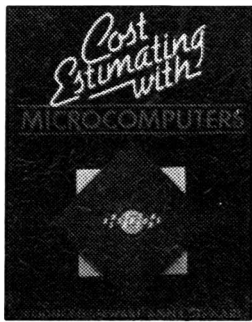
Your Computer Bookstore by Mail

Every 3-4 weeks, you'll receive the PCBC Bulletin describing the Main Selection and Alternates. If you want the Main Selection, do nothing and it will come automatically. For an alternate selection (or none at all), mark your preference on the reply card and return it by the date specified. You'll always have at least 10 days to decide.

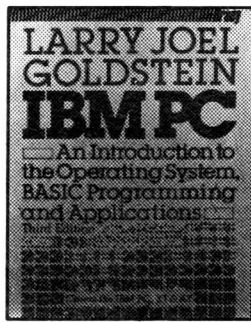
As a PCBC member, you are only obligated to purchase 3 books (in addition to the \$3.95 selection) during the next year, and may cancel any time after that.

Choose your first book for just \$3.95 —
save up to \$36.00!

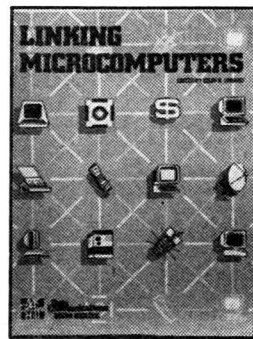
Book #18116-4
Pub. pr. \$29.50



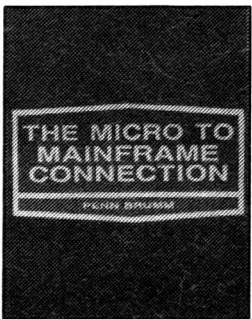
Book #44815-9
Pub. pr. \$19.95



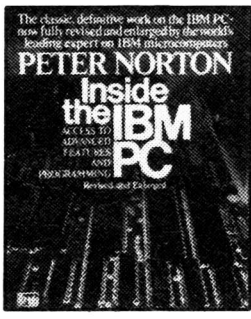
Book #53704-3
Pub. pr. \$26.95



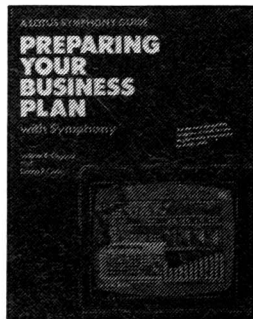
Book #58038-1
Pub. pr. \$22.95



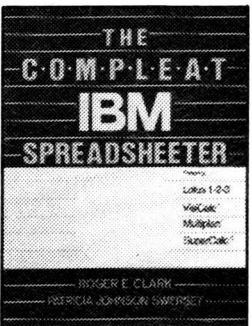
Book #D5831-5
Pub. pr. \$21.95



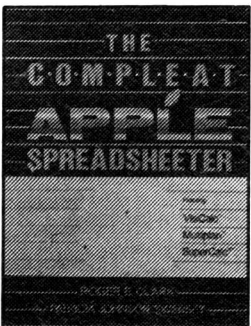
Book #69897-7
Pub. pr. \$26.95



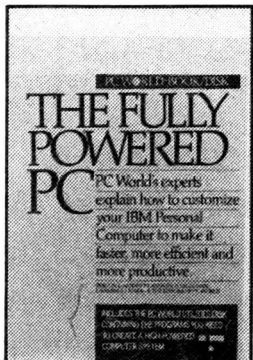
Book #15511-9
Pub. pr. \$29.95



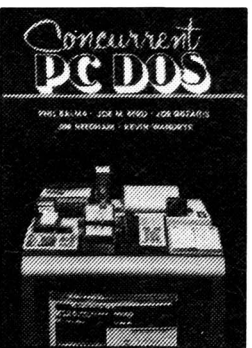
Book #15509-3
Pub. pr. \$29.95



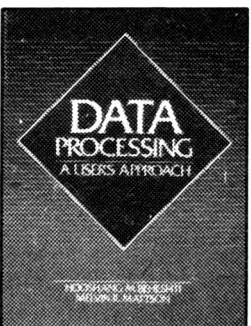
Book #33226-2
Pub. pr. \$39.95



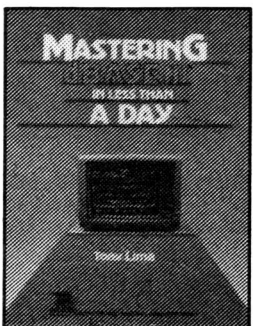
Book #16727-0
Pub. pr. \$23.33



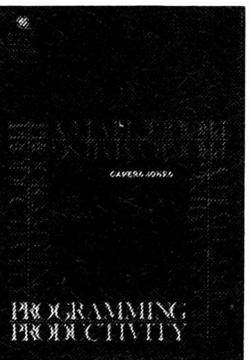
Book #R1240-2
Pub. pr. \$32.00



Book #55981-5
Pub. pr. \$19.95



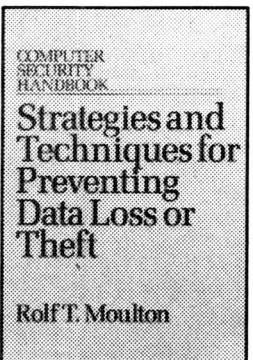
Book #73049-9
Pub. pr. \$38.95



Book #88177-1
Pub. pr. \$31.00



Book #16580-3
Pub. pr. \$39.95



PRENTICE-HALL
**personal
computer**
BOOK CLUB

Card missing? Write to:

Personal Computer Book Club
A Prentice-Hall Book Club
P.O. Box 10621
Des Moines, IA 50336-0621

(For More Information Circle 27)

Personal Computer Book Club/A Prentice-Hall Book Club
P.O. Box 10621, Des Moines, IA 50336-0621

SEND NO MONEY!

Book # _____

YES, I want the benefits of PCBC membership. Please rush me the book indicated for a 10-day free trial. If not 100% satisfied, I'll return it and owe nothing. Otherwise, I'll pay just \$3.95 (plus shipping, handling and applicable sales tax, which are added to all shipments) and agree to purchase 3 additional books at members' discounts during the year, according to the terms of this offer. (Not valid without signature.)

Signature _____

Name _____

Address/Apt. _____

City/State/Zip _____

For new members only, in the Continental USA and Canada.
Enrollment subject to acceptance by PCBC.

Text And Graphics: Together At Last

INSET 2 is a RAM-resident utility program (it consumes 128k) that enables you to print text and graphics on the same page; non-copy protected; \$99 retail; American Programmers Guild, 12 Mill Plain Road, Danbury, CT, 06811; (203) 794-0396. (For more information circle 255 on the Free Information Card.)

A memo, letter, or report that contains charts or graphs is an eye catcher. The charts, especially if in color, draw attention and quickly illustrate points within the text. Yet, combining text and graphics is often difficult. Most graphics and word processing packages have no provision for mixing their separate outputs on the same page.

A relatively expensive solution is to buy a desktop publishing program like Ventura Publisher, which can read in and format text and graphics from a variety of programs. At the other extreme is the do-it-yourself procedure of putting the paper through the printer twice, leaving sufficient white space during the first pass to incorporate the graphic the second time through. Though no extra software is required here, the only control you have over the page is via a lot of trial and error.

Inset 2 takes the middle ground between desktop publishing and printer gymnastics. In addition, it is easier to

use and more powerful than the original Inset version was.

Like the original Inset, Inset 2 resides in RAM. Once activated, Inset enables you to capture a graphic image and save it. You then insert the file name of the saved graph, surrounded by brackets, where you want the image to appear in your word processing document.

You activate Inset 2 by pressing the Shift-PrtSc or the Alt-PrtSc key combination simultaneously. You can use the Shift and PrtSc combination when working with text-based files and many graphics-based files. But when using some graphics packages, including Chart-Master from Decision Resources, you have to use the Alt-PrtSc combination. The Inset manual mentions that both combinations are available, but doesn't explain when and why you have to use one or the other.

There are some other rough spots in the manual. For example, subheadings for the various menus are explained alphabetically. This forces you to frequently flip through the manual to learn each of the commands under a menu heading. It would have been better to group the explanation of commands under their menu heading. The chapter that describes the setup procedure refers you to Appendix D for a list of printers supported by Inset 2. Unfortunately, there is no Appendix D. Fortunately, the table of contents correctly states that the list of supported printers appears in Appendix C.

One of the major improvements in

Inset 2 is the ability to capture images from an EGA monitor. Since the program captures screen images, the resolution of the graph is only as good as the pixel resolution on-screen. With Inset 2, you can print a graph with the sharper 640-by-350-pixel resolution of EGA display. Inset 2 also works with CGA, Hercules monochrome graphics, and the AT&T monochrome or enhanced video display.

Inset 2 enables you to modify the graphic image before you print it. The edit menu contains commands for drawing lines, boxes, and circles; changing the width of lines; changing colors; and magnifying a portion of the screen for more detailed work. In addition, the edit menu enables you to choose the font, orientation, and size of the text in the graph. Italics is included with Inset 2 and other fonts can be used.

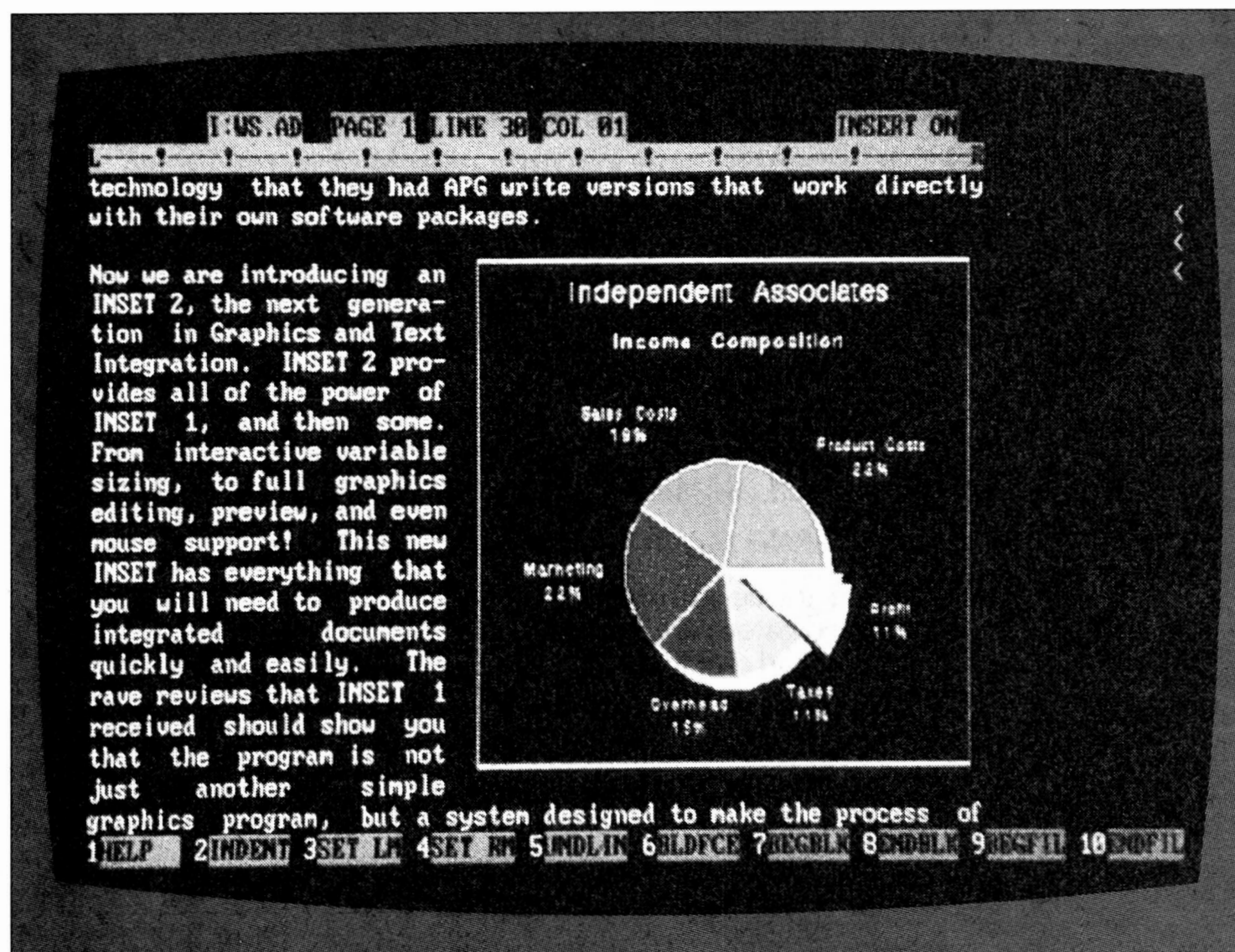
The Modify menu enables you to rotate the image 90 degrees. You can also modify the image's size, change the colors, put a border around the image, or select a single or double pass mode when printing. Another selection on the Modify menu enables you to preview how the image will appear with the text, a feature that wasn't available on the original Inset.

Inset 2 contains an easier installation routine than the original version. The setup choices include the type of screen display, printer used, printer width, and pitch. A wide variety of printers are supported, including the Brother DM45; Canon LBP-8 laser printer; Diablo 630; Epson FX, RX, and JX series; Hewlett-Packard LaserJet; IBM Graphics Printer; IBM Color Printer; Epson LQ 1500; NEC P2, P3, and P5; Toshiba P-1340, P-1350, and P-135; and Xerox 4045.

Images saved with the original Inset cannot be used with Inset 2. Users can convert their old graphic files to work with Inset 2 using a program included with the Inset 2 disk.

Despite some shortcomings in the manual, Inset 2 is an easy to use and powerful tool for combining text and graphics. You can use it simply as a way to combine a graph into a word processing document, or you can use the editing functions to tinker with the appearance of the graph before combining it with the document. Anyone who wants to add graphics to a printed page—but doesn't need the more sophisticated features or expense of a desktop publishing program—will find Inset 2 to be a low-cost alternative.

—Patrick Honan



Inset 2 enables you to preview the way the graph will look inserted in the text.

EGAWONDER™

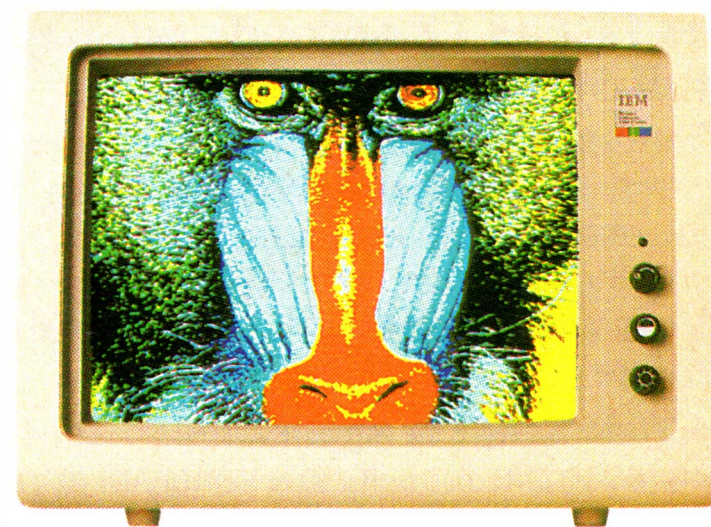
Any Software. Any Monitor. Any Time.¹



**Any Software on
an EGA Monitor**



**Any Software on a
TTL Monochrome Monitor
(or Compaq Portable)²**



**Any Software on an RGB
Color Monitor³
(or Composite, IBM Portable)**

Upgrade to EGA without an EGA Monitor

The unique ATI EGA WONDER allows upgrade to the new EGA graphics standard without the purchase of an expensive EGA monitor. EGA WONDER runs EGA, CGA, MDA, Hercules and 132 column software on EGA Color, RGB Color, TTL Monochrome and Composite monitors. Extremely flexible, EGA WONDER maintains downward compatibility to both existing software and existing monitors. On the internal monitor of a Compaq PC Portable, EGA WONDER displays EGA, CGA, MDA and Hercules software via an optional expansion module.² For EGA monitor users, the ATI EGA WONDER improves the display of CGA software by producing high resolution 8x14 text and double scanned graphics. Old CGA software

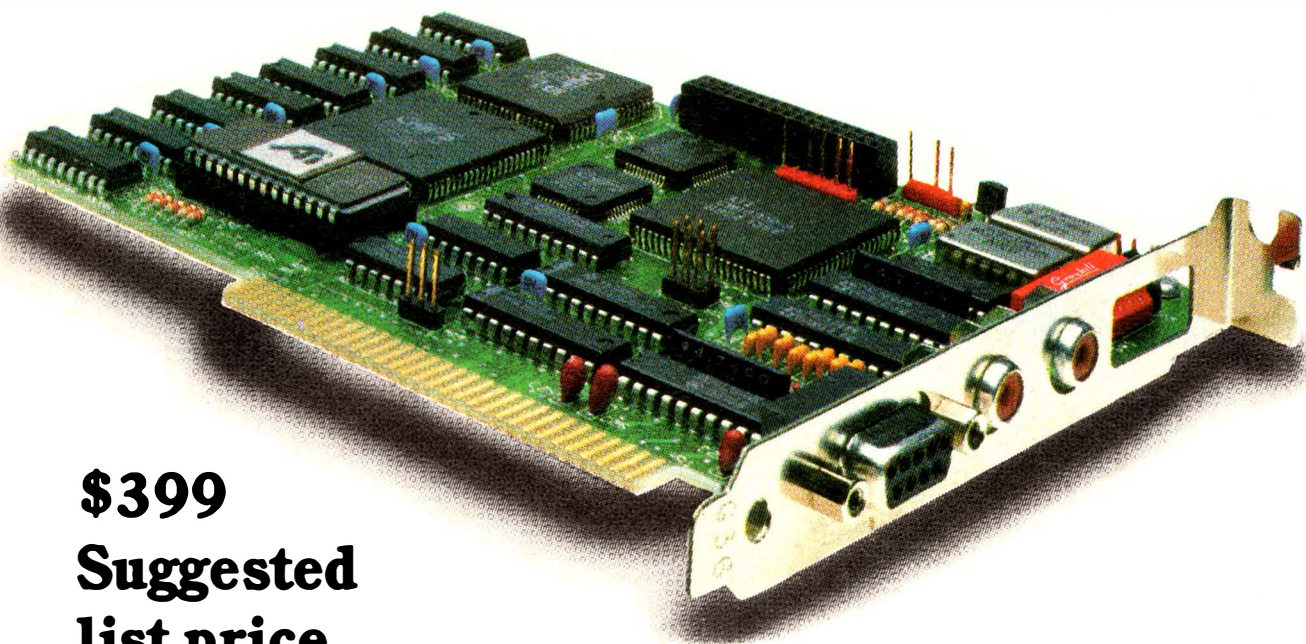
is now displayed with EGA quality. Completely compatible to IBM's EGA, ATI's EGA WONDER performs smooth scrolling, pixel panning and windowing. No memory modules are required because 256K of video memory is a standard feature. EGA WONDER is the only card able to display EGA software on the internal monitor of both the IBM PC Portable and the Compaq PC Portable. EGA WONDER provides an NTSC Composite signal for interface to a Polaroid Palette.

SoftSense Automatic Mode Switching

User friendly and easy to use, the ATI EGA WONDER has built-in SoftSense Automatic Mode Switching. It is actually able to sense and automatically switch between EGA and CGA color modes or between EGA, MDA and Hercules monochrome modes. The ATI EGA WONDER is compatible at the hardware level to the IBM Enhanced Graphics Adapter, the IBM Color/Graphics Adapter, the IBM Monochrome Display Adapter and the Hercules Graphics Card to minimize software incompatibilities.

EGA WONDER is now available from all major computer stores, call us today at (416) 477-8804 for more information.

\$399
Suggested
list price



Trademarks IBM PC Portable - EGA CGA MDA - International Business Machines - Compaq - Compaq Computer Corporation - Hercules - Hercules Computer Technology - Polaroid Palette - Polaroid Corporation.

1. Any Software, Any Monitor, Any Time applies to IBM graphics, standards, monitors, software.
2. Optional Compaq Expansion Module (no 132 Columns) Suggested list price \$99.
3. EGA, MDA, Hercules software displayed via interlacing. Flickering effect of interlacing reduced with purchase of anti-glare screen filter.



TECHNOLOGIES INC.

Technology you can Trust.

ATI Technologies Inc., 450 Esna Park Dr.,
Markham, Ontario, Canada L3R 1H5. TLX. 06-966640.
(For More Information Circle 77)

PRINCETON LS-300— LET YOUR PC SCAN NEW HORIZONS

Scan text, images and graphics into your IBM PC or compatible as fast as 12 seconds per page at full 300 dpi resolution.

The compact Princeton LS-300 Scanner is versatile, easy to use and appropriate for desktop use. You can also team the LS-300 Scanner with the new Princeton LM-300 Print Preview Monitor and save time by viewing a full page before you print.

A Wide Range of Applications The LS-300 helps you increase productivity in a variety of applications. With hardware dithering for gray levels, you can combine photographs and illustrations with reports or proposals. You can produce desktop publishing materials with extra visual impact. And, because the LS-300 reads virtually any page, you can scan in documents that can be sent at full 300 dpi resolution for facsimile transmission, or stored for future use.

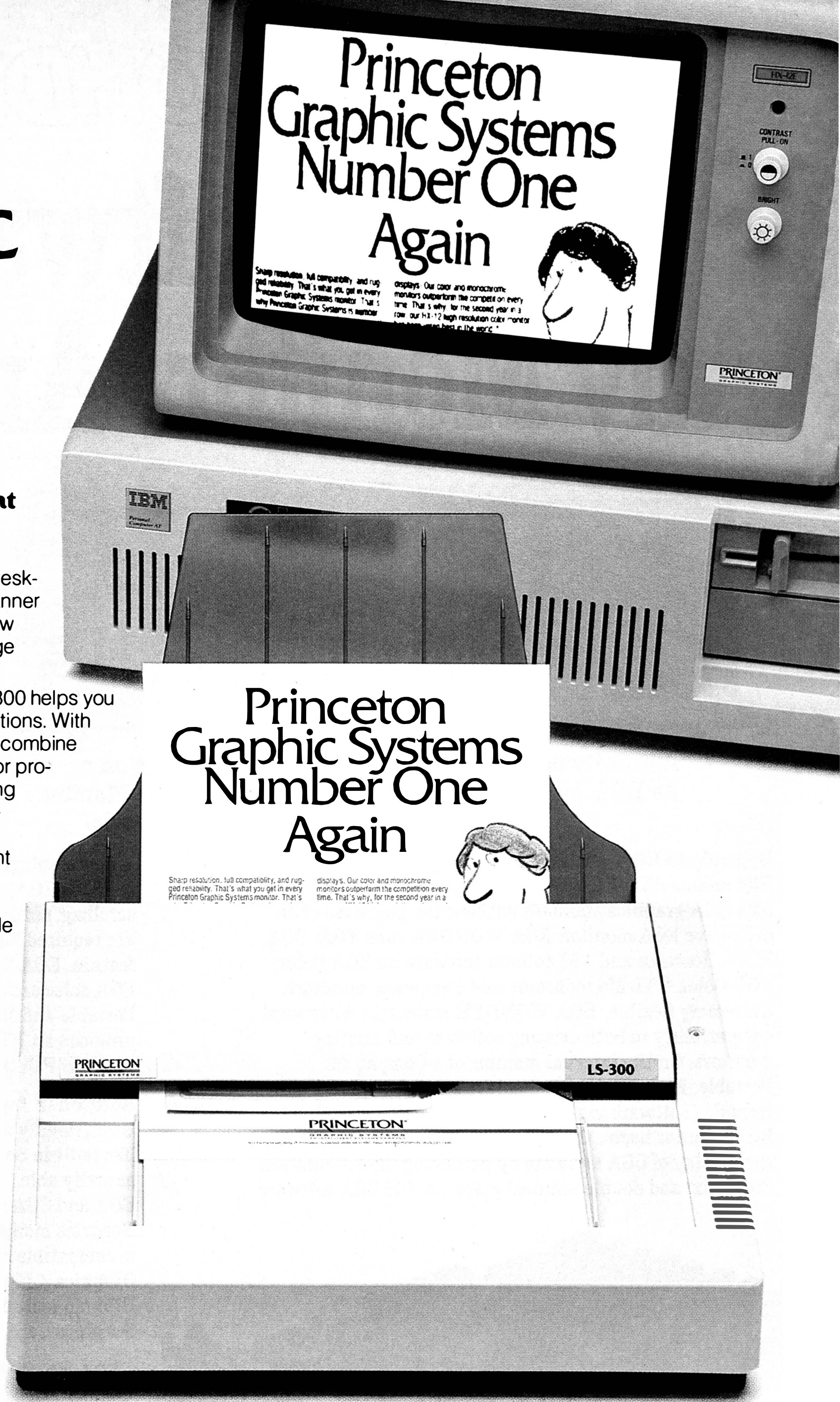
To convert typewritten pages into editable text, an OCR option is available.

A High Resolution Image Scanning at 300 dpi, the LS-300 gives you the same resolution as the output of a quality desktop laser printer. It also maintains compatibility with your EGA software and display.

IBM Compatibility, Princeton Reliability The Princeton LS-300 is designed for use with your IBM PC/XT/AT or compatible... its attractive price includes adapter card, cable and software. What's more, you can depend on the LS-300 to keep on working because it features built-in Princeton quality and durability.

See Your Dealer for a Demonstration

If you're ready for a versatile desktop scanner that can help you increase your productivity, see your Princeton Dealer today for a demonstration. Or call for more information.



PRINCETON®

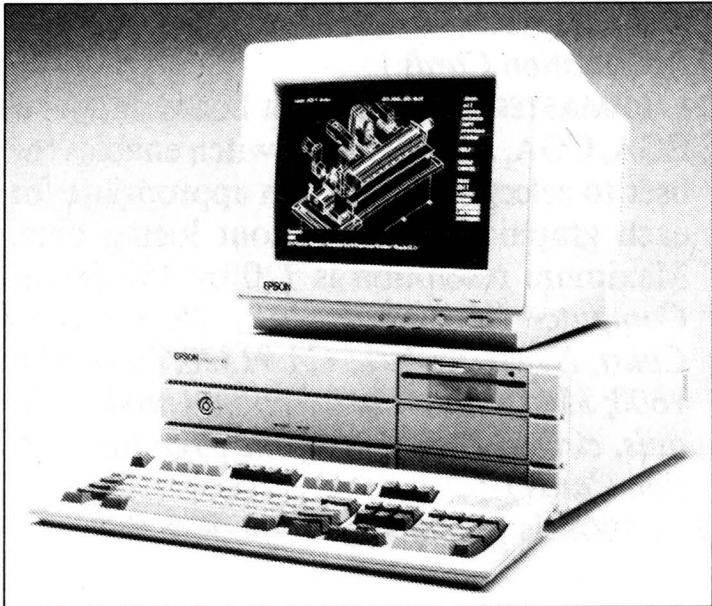
GRAPHIC SYSTEMS
AN INTELLIGENT SYSTEMS COMPANY

IBM is a registered trademark of
International Business Machines Corp.

601 Ewing Street, Bldg. A, Princeton, NJ 08540.
800-221-1490 (Extension 93), 609-683-1660 (NJ only), Telex 821402 PGS PRIN.
(For More Information Circle 15)

Epson's 80286-Based Equity III

SYSTEMS



The Equity III PC AT compatible has a selectable clock speed of 6/8/10MHz.

EQUITY III is an AT compatible that features an 80286 microprocessor with 6/8/10MHz selectable clock speed, 640k of RAM, a 1.2Mb floppy disk drive, a key-lock switch, an enhanced AT-style keyboard, and a parallel and serial port. Options include a 40Mb Winchester disk drive with an access time of 28 milliseconds, a 360k or 1.2Mb floppy disk drive, a color graphics board, and EGA board. *Epson America, Inc., Computer Products Division, 2780 Lomita Blvd., Torrance, CA 90505; (213) 539-9140; \$2,695 for the single floppy configuration, \$3,895 for the single floppy/40Mb hard disk configuration, retail. (For additional product details, circle 108 on one of the Free Information Cards.)*

BABY BLUE 16 is a 16-bit 8088 IBM PC compatible with 256k, one 360k floppy drive, an AT-style keyboard, RGB color, a composite adapter supporting 640-by-200-pixel resolution graphics, a serial port, parallel port, and game port. *Baby Blue Computer Systems, 303 Hegenberger Road, Oakland, CA 94621; (415) 636-1401; \$399 retail. (For additional product details, circle 105 on one of the Free Information Cards.)*

CCC-365/AT is available in a variety of 286-based configurations, all of which have 1Mb of RAM, 6/8MHz switchable operating speed, wait/no-wait switchable memory, a 1.2Mb floppy drive, a Western Digital controller card, a parallel and a serial port, a 200-watt power supply, and an enhanced AT-style keyboard. Users can choose a 30- or 40Mb hard drive. *Computer Components Corp., PO Box 12017, Research Triangle Park, NC 27709; (800) 843-7012; \$2,395 and up, depending on configuration, retail. (For additional product details, circle 106 on one of the Free Information Cards.)*

DESKPRO 286 MODEL 40 features a 40Mb fixed disk drive, 640k of RAM, a 1.2Mb

disk drive, seven expansion slots, and a 101-key enhanced keyboard. *Compaq Computer Corp., 20555 FM 149, Houston, TX 77070; (713) 370-0670; \$4,999 retail. (For additional product details, circle 107 on one of the Free Information Cards.)*

PC-7000A and **PC-7100** are two portable computers from Sharp Electronics. The PC-7000A includes dual 5.25-inch floppy disk drives, 320k of RAM, a 25-line by 80-character illuminated crystal display, an AT-style keyboard, serial and parallel ports, and MS-DOS 2.1. The PC-7100 sports the same configuration, except for the inclusion of a 20Mb hard disk mounted on an internal expansion card. *Sharp Electronics Corp., Systems Division, Sharp Plaza, Mahwah, NJ 07430; (201) 529-9500; \$1,795, PC-7000A; \$2,795, PC-7100; retail. (For additional product details, circle 109 on one of the Free Information Cards.)*

THE PORTABLE OFFICE is a 22-pound Nicad battery-powered three-piece system comprised of a computer, printer, and facsimile machine. It features an enhanced Data General/One Model II portable computer with back-lighted LCD screen and internal 10Mb Winchester drive, Medbar's Port-A-Fax machine, and a Diconix 150 ink jet printer. An added EPROM chip contains Medbar ROM-resident software. *Medbar Enterprises, Inc., 71-08 51st Ave., Woodside, NY 11377; (718) 335-0404; \$479 retail. (For additional product details, circle 110 on one of the Free Information Cards.)*

SAM 300I IBM PC AT compatible includes 640k of RAM, a 1.2Mb floppy disk drive, two serial ports, one parallel port, a color graphics board, a clock/calendar, a 195-watt power supply, and a keyboard. *HiTech International, Inc., 1180-M Miraloma Way, Sunnyvale, CA 94086; (408) 738-0601; \$995 retail. (For additional product details, circle 111 on one of the Free Information Cards.)*

SM 286/12 is an 80286-based system capable of supporting up to 12 users. The standard configuration is 1Mb of RAM, five serial ports, one parallel port, a 360k floppy disk drive, a 36Mb (formatted) hard disk drive, a 60Mb streaming tape drive, and one terminal, plus the Xenix operating system. The system can be expanded to include 15Mb of RAM, 256Mb of hard disk storage, and 12 terminals. *Gulfstream Micro Systems, 1065 S. Rogers Circle, Boca Raton, FL 33431; (800) 443-0500; \$7,585 retail. (For additional product details, circle 112 on one of the Free Information Cards.)*

V-MARC 88, a vertical 5.7-pound lap-size computer, uses a 16-bit 8088 microprocessor running at 8MHz with an 8087 math software set. The unit includes a bidirectional 40- (or 80 in compressed mode) col-

umn printer, a QWERTY keyboard with numeric keypad, seven slots for RAM or EPROM modules, and a parallel port. Each plug-in application cartridge has up to 128k of memory; modules are available in the areas of insurance, banking, moving and storage, graphics, finance, fuel consumption, communications, and medicine. *V-Marc, Inc., 8081 Zionsville Road, PO Box 68886, Indianapolis, IN 46268; (317) 872-7224; \$1,000 to \$2,000 direct order. (For additional product details, circle 113 on one of the Free Information Cards.)*

Z-148 is a 20Mb hard disk drive system featuring the 8088 processor, which operates at speeds of 4.77/8MHz with no wait states. This includes one 5.25-inch floppy disk drive, 256k, a parallel and serial port, RGB/composite video output, an 8087 socket, and 77-watt power supply. MS-DOS 3.1 is included. *Zenith Data Systems, 1000 Milwaukee Ave., Glenview, IL 60025; (312) 391-8860; \$2,199 retail. (For additional product details, circle 114 on one of the Free Information Cards.)*

Z-248 combines zero wait-state technology with an Intel 80286 processor running at 8MHz. It has an EGA card, 512k of RAM, a 20Mb hard disk, a 1.2Mb hard disk, and six open slots. Other configurations are also available. *Zenith Data Systems, 1000 Milwaukee Ave., Glenview, IL 60025; (312) 391-8860; \$4,399 retail. (For additional product details, circle 115 on one of the Free Information Cards.)*

Z-386 uses Intel's 80386 32-bit processor and operates at 16MHz. It has AT software compatibility and expanded memory specifications support. Features include 10 bus slots (six are open), 1Mb of RAM, a combined floppy-Winchester controller, serial and parallel ports, and sockets for 80287 or 80387 coprocessors. *Zenith Data Systems, 1000 Milwaukee Ave., Glenview, IL 60025; (312) 391-8860; \$6,499 for the 40Mb version, \$7,499 for the 80Mb version. (For additional product details, circle 116 on one of the Free Information Cards.)*

PERIPHERALS

AST-5000 is a Small Computer System Interface-compatible (SCSI) hard disk subsystem and streaming cartridge tape backup. Users can select storage capacities of 120, 240, or 320Mb. The system can be expanded up to 2.2Gb. It features an average access time of 28 milliseconds and a 125Mb cartridge tape backup, and supports up to eight peripheral devices, including multiuser and LAN systems. *AST Research, Inc., 2121 Alton Ave., Irvine, CA 92714; \$7,795, 120Mb; \$9,995,*

PRODUCT LISTINGS

240Mb; and \$11,195, 320Mb; retail. (For additional product details, circle 117 on one of the Free Information Cards.)

AUTO PLOT is a D-size open frame flatbed pen plotter with a 16-bit processor. It makes drawings of up to 22 by 34 inches with eight pens (optional) at 0.001-inch resolution. Plot speed is selectable up to 10 inches per second. The plotter has a 256k buffer, expandable to 1Mb, and its HPGL command set is compatible with most CAD programs, including AutoCAD. *GTCO Corp., 7125 Riverwood Drive, Columbia, MD 21046; (301) 381-6688; \$4,495 retail. (For additional product details, circle 118 on one of the Free Information Cards.)*

DDE PC DATA BUFFER is an internal buffer that installs into a long card slot. It will support both a parallel and serial printer and/or plotter using any standard IBM PC parallel cable or IBM PC AT serial cable. It is available in memory sizes from 256k to 1,024k. Power consumption is seven watts. *Data Doc Electronics, Inc., 9415 Neils Thompson Drive, Austin, TX 78759; (512) 836-7323; \$479.95 to \$629.95, retail. (For additional product details, circle 119 on one of the Free Information Cards.)*

F2010 COMPACT LASER PRINTER is a 10-page per minute printer with 1.5Mb of RAM that produces documents at 850 characters per second at 300 dots per inch. Font styles, emulation modes, character code sets, and feed

and stack options are all front panel-selectable. It has dual 250-page paper feed trays, a collator, and a sorter with a 150-page top bin and four 25-page lower bins. The F2010 handles legal, letter, A4 and B5 size paper. *Kyocera Unison, Inc., 3165 Adeline St., PO Box 3056, Berkeley, CA 94703; (415) 848-6680; \$5,295 retail. (For additional product details, circle 120 on one of the Free Information Cards.)*

FM-2400E is a Hayes-compatible 2400-bits per second modem for asynchronous or synchronous transmission in 2400, 1200, or 300 bits per second. It is compatible with most American and international dial-up standards. *Franklin Telecom, 31320 Via Colinas #113, Westlake Village, CA 91362; (818) 706-1186; \$460 retail. (For additional product details, circle 121 on one of the Free Information Cards.)*

FX-BM88 facsimile board enables the sending of a file or a scanned image to a Group 3 (CCITT International Standard) facsimile machine and the ability to receive documents. A document received from a facsimile machine can be viewed on a computer display, edited on-screen, and then printed out using a dot matrix or laser printer. It features a polling function and facilities for creating a telephone number directory as well as displaying and recording all facsimile activities. An integral modem provides high-speed transmission of up to 9600 bits per

second. *Panasonic Industrial Co., One Panasonic Way, Secaucus, NJ 07094; (201) 348-7000; \$1,000 retail. (For additional product details, circle 122 on one of the Free Information Cards.)*

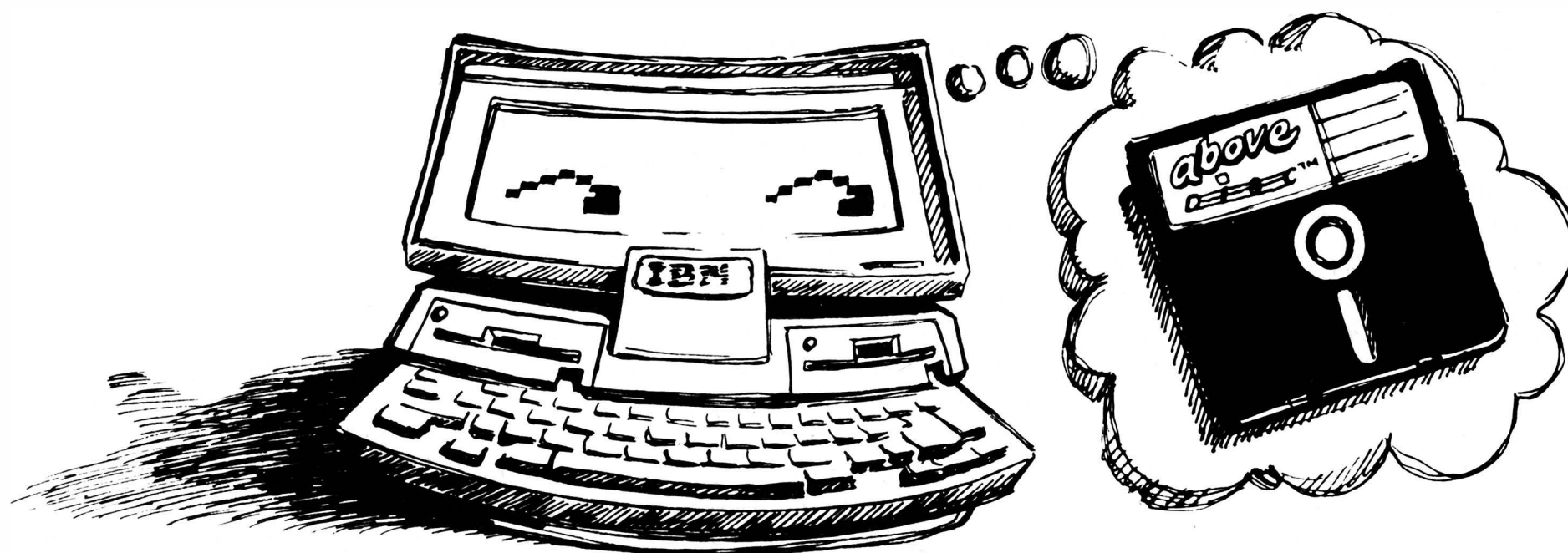
FX-RS505 is a high-resolution flatbed image scanner that transfers graphic images of characters and artwork with a resolution of up to 400 dots per inch at six seconds per page. It has 16-shade monochrome output and multimode resolution. *Panasonic Industrial Co., One Panasonic Way, Secaucus, NJ 07094; \$1,300 retail. (For additional product details, circle 123 on one of the Free Information Cards.)*

GRAPHMASTER enhancement board supports EGA, CGA, and MDA. A switch enables the user to select the resolution appropriate for each graphics mode without losing data. Maximum resolution is 720 by 350 pixels. *Computer Peripherals, Inc., 2635 Lavery Court, Newbury Park, CA 91320; (800) 854-7600; \$545 retail. (For additional product details, circle 124 on one of the Free Information Cards.)*

GTX-100R is an intelligent modem that ena-

For more product information, please circle the appropriate number on one of the Free Information Cards that are located facing the Product Index within the product review section or opposite the Advertiser's Index.

Now 8MB of Expanded Memory . . . without Hardware or the Expense!!!



ABOVE DISC™ offers the owners of Personal Computers the most revolutionary way to utilize up to 8MB of Lotus-Intel-Microsoft expanded memory.

Here are just some of the many applications:

- Convert 8MB of hard disk storage to RAM
- Transform extended memory into expanded memory
- Gain up to 760K of RAM from your floppy disk
- Operate EMS programs at 12 Mhz or faster

ABOVE DISC IS A TRADEMARK OF TELE-WARE WEST

Until now, if you wanted expanded memory you needed expensive hardware.

ABOVE DISC™ OFFERS A NEW STANDARD.

\$99⁹⁵

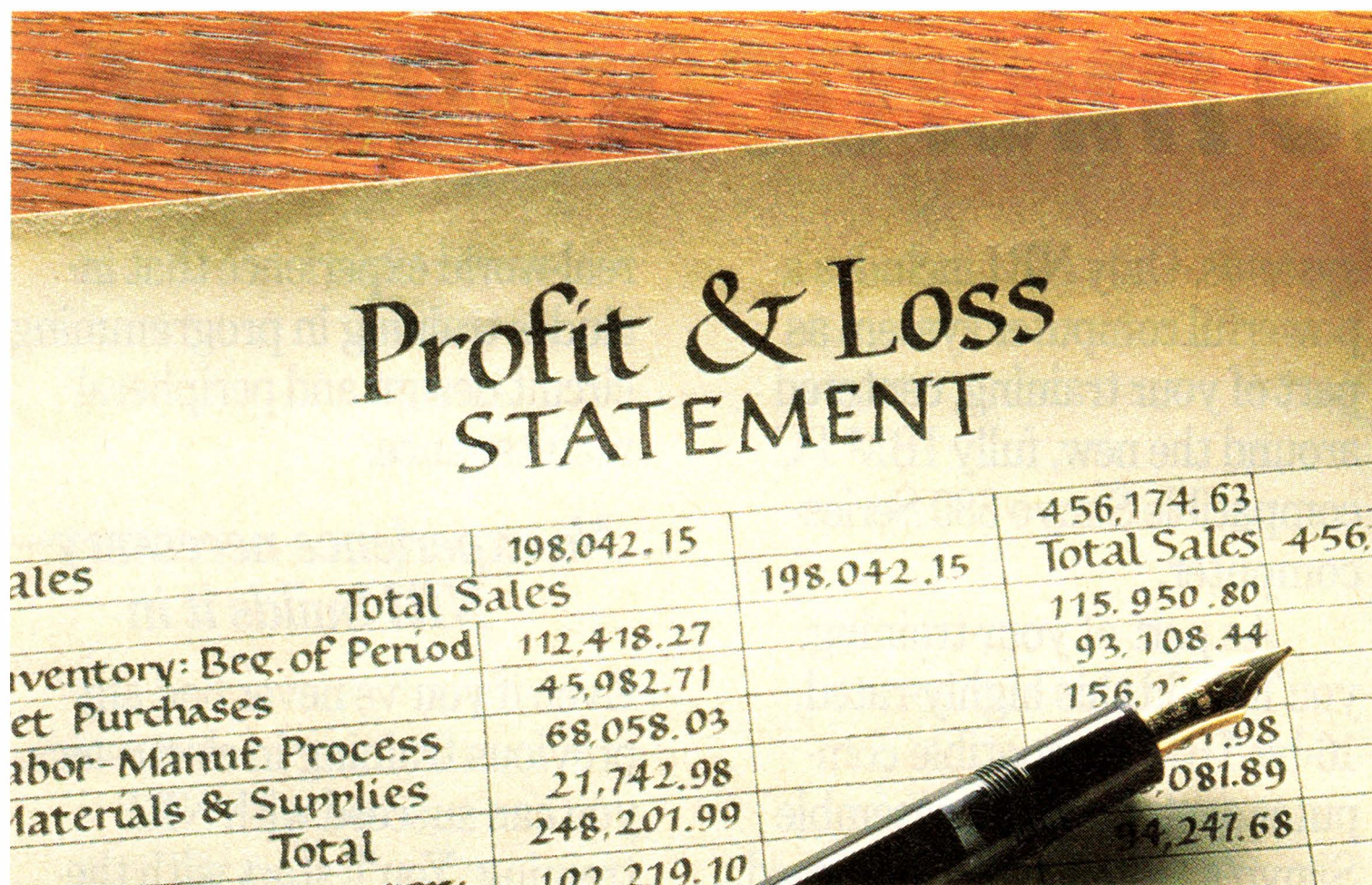
(800) 654-5301

IN CALIFORNIA
(213) 493-2471

909 ELECTRIC AVENUE • SUITE 202 • SEAL BEACH, CA 90740

(For More Information Circle 169)

You don't have to take this from your accountant anymore.



Profit & Loss STATEMENT			
	198.042.15		456,174.63
Sales		198.042.15	Total Sales 456,174.63
Inventory: Beg. of Period	112,418.27		115,950.80
Net Purchases	45,982.71		93,108.44
Labor-Manuf. Process	68,058.03		156,258.98
Materials & Supplies	21,742.98		21,742.98
Total	248,201.99		248,201.99
	102,219.10		102,219.10

That means there's no need to switch modules when you want to go from accounts payable to accounts receivable—or vice versa.

It means you can easily write financial reports the way you want to see them. Or even retrieve data from damaged disks.

But it also means one other important thing.

Do it yourself instead.

With the In-House Accountant from Migent, generating your own financial statements every month is a breeze.

That's because In-House Accountant is the only program for IBM PCs and compatibles that has all the features you need to make routine bookkeeping a painless, natural part of the way you do business.

Pop-up windows give you immediate access to account information (by name, or number, or whatever criteria you choose). As well as balances. And recurring transactions. All of which you can just point to and paste into your forms or records.

There's even an on-screen calculator, full-function financial formulas and help screens at the same level of the program that you're currently in.

Unlike other accounting software that's been designed merely to automate paper-based systems, In-House Accountant was designed from scratch to take full advantage of your computer's power.

In-House Accountant costs only \$99.

That's the difference between our product and those built on outdated methods: We're able to save you money right from the start.

Which is something your accountant will appreciate, too.

If you'd like more information about In-House Accountant, or the name of the dealer nearest you, give us a call at **800-633-3444**. Or just send in the coupon.

In-House Accountant. It'll help put your house in order.

☐ Please send me more information about In-House Accountant. And send me the name of the dealer in my area.

Name

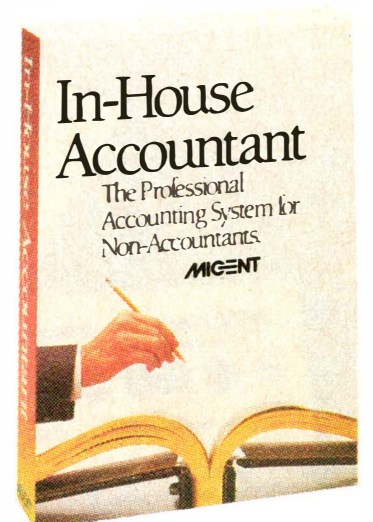
Address

City State Zip

Phone

Send to: Migent, Inc.

865 Tahoe Blvd., Call Box 6, Incline Village, Nevada 89450-6062



503

Train for the Fastest Growing Job Skill in America

Only NRI teaches you to service all computers as you build your own fully IBM compatible microcomputer

With computers firmly established in offices—and more and more new applications being developed for every facet of business—the demand for trained computer service technicians surges forward. The Department of Labor estimates that computer service jobs will actually *double* in the next ten years—a faster growth rate than for any other occupation.

Total systems training

No computer stands alone... it's part of a total system. And if you want to learn to service and repair computers, you have to understand computer

systems. Only NRI includes a powerful computer system as part of your training, centered around the new, fully IBM PC compatible Sanyo 880 Series computer.

As part of your training, you'll build this highly-rated, 16-bit IBM compatible computer system. You'll assemble Sanyo's "intelligent" keyboard, install the power supply and disk drive, and interface the high-resolution monitor. The 880 Computer has two operating speeds: standard IBM speed of 4.77 MHz and a remarkable turbo speed of 8 MHz. It's confidence-building,

real-world experience that includes training in programming, circuit design and peripheral maintenance.

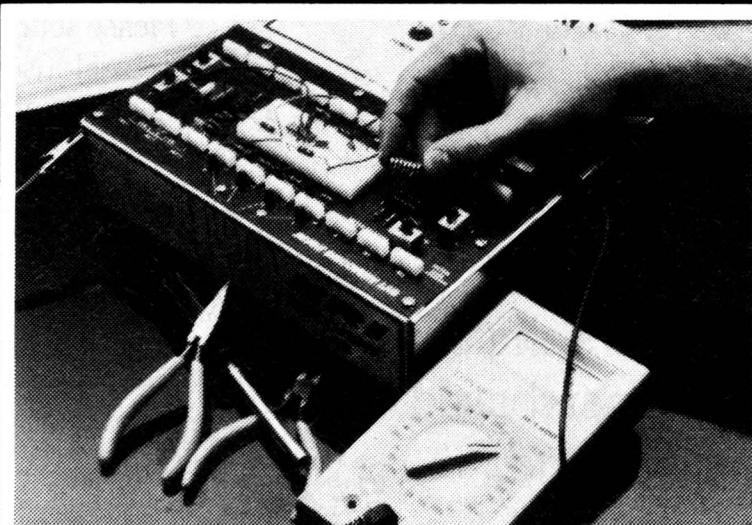
No experience necessary—NRI builds it in

Even if you've never had any previous training in electronics, you can succeed with NRI training. You'll start with the basics, then rapidly build on them to master such concepts as digital logic, microprocessor design, and computer memory. You'll build and test advanced electronic circuits using the exclusive NRI Discovery Lab®, professional digital multimeter,

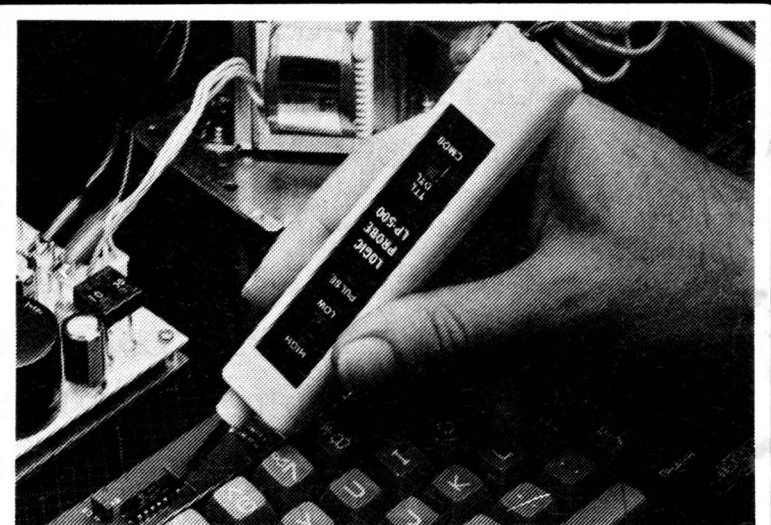
Learn Computer Servicing Skills with NRI's "Hands-On" Training...



Using NRI's unique Action Audio Cassette, you are talked through the operation and practical application of your hand-held digital multimeter—the basic, indispensable tool for the computer specialist.



You'll set up and perform electronics experiments and demonstrations using your NRI Discovery Lab. You'll even interface the lab with your computer to "see" keyboard-generated data.



After you build this digital logic probe, you'll explore the operation of the Sanyo detached "intelligent" keyboard and its dedicated microprocessor.

RUSH POSTAGE-PAID CARD
FOR YOUR FREE CATALOG

- **COMPUTER ELECTRONICS** training prepares you to service all computers as you build your own 16-bit IBM PC compatible computer. Total system program includes disk drive, test equipment, bundled software, and NRI Discovery Lab.
- **TV/VIDEO/AUDIO SERVICING** includes training with a state-of-the-art 27" high resolution broadcast stereo TV for learning troubleshooting and professional bench techniques.
- **SATELLITE ELECTRONICS** training gives you the skills to service both consumer and commercial satellite earth station equipment as you assemble your own home satellite TV system.
- **ROBOTICS** training features remote-controlled, mobile, fully programmable robot you build, experiment with, and keep along with other test equipment.



CHECK
ONE

Send me your free catalog
on NRI Training in:

- ☐ Computer Electronics
- ☐ TV/Video/Audio Servicing
- ☐ Robotics
- ☐ Satellite Electronics
- ☐ Digital Electronics Servicing
- ☐ Data Communications
- ☐ Electronic Design Technology
- ☐ Industrial Electronics
- ☐ Communications Electronics
- ☐ Basic Electronics
- ☐ Building Construction and Remodeling
- ☐ Automotive Servicing
- ☐ Small Engine Servicing
- ☐ Electrician
- ☐ Air Conditioning, Heating, and Refrigeration
- ☐ Locksmithing and Electronic Security
- ☐ Telephone Servicing
- ☐ Appliance Servicing
- ☐ Photography
- ☐ Bookkeeping and Accounting

Name _____			Age _____		
(Please Print)					
Street _____					
City _____		State _____		Zip _____	

For career courses approved
under G.I. Bill ☐ Check for details.



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO. 10008 WASHINGTON, D.C.

POSTAGE WILL BE PAID BY ADDRESSEE

NRI Schools
McGraw Hill Continuing
Education Center
3939 Wisconsin Avenue
Washington, D.C. 20077-9265



NEW!

Train with the newest Sanyo 880 Series Computer—it's fully IBM-compatible and runs almost twice as fast as the IBM PC!

Your NRI total systems training includes all of this: NRI Discovery Lab® to design and modify circuits • Four-function digital multimeter with walk-you-through instruction on audio tape • Digital logic probe for visual examination of computer circuits • Sanyo 880 Series Computer with "intelligent" keyboard and 360K double-density, double-sided disk drive • High resolution monochrome monitor • 8K ROM, 256K RAM • Bundled software including GW BASIC, MS DOS, WordStar, CalcStar • Reference manuals, schematics, and bite-sized lessons.

and logic probe. Like your computer, they're all yours to keep as part of your training. You even get some of the most popular software, including WordStar, CalcStar, GW Basic and MS DOS.

Send for 100-page free catalog

Send the post-paid reply card today for NRI's 100-page,

full-color catalog, with all the facts about at-home computer training. Read detailed descriptions of each lesson, each experiment you perform. See each piece of hands-on equipment you'll work with and keep. And check out NRI training in other high-tech fields such as Robotics, Data Communications, TV/Audio/Video Servicing, and more.

If the card has been used, write to NRI Schools, 3939 Wisconsin Ave., N.W., Washington, D.C. 20016.

NRI SCHOOLS

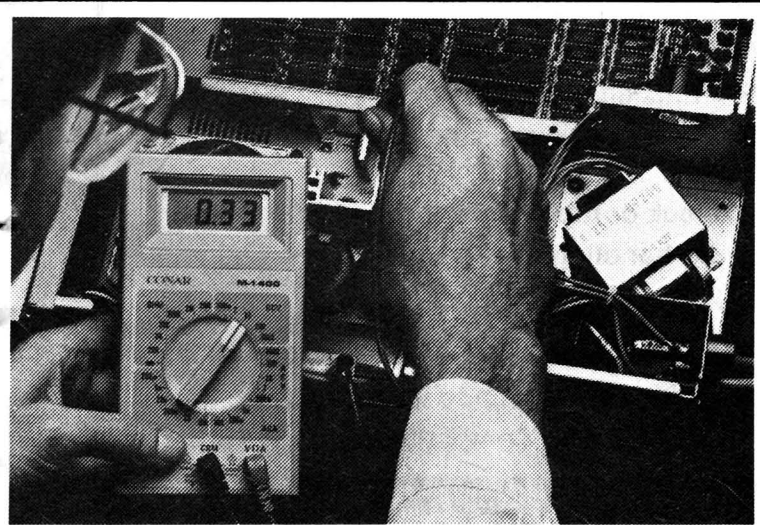
McGraw-Hill Continuing Education Center
3939 Wisconsin Avenue, NW
Washington, DC 20016



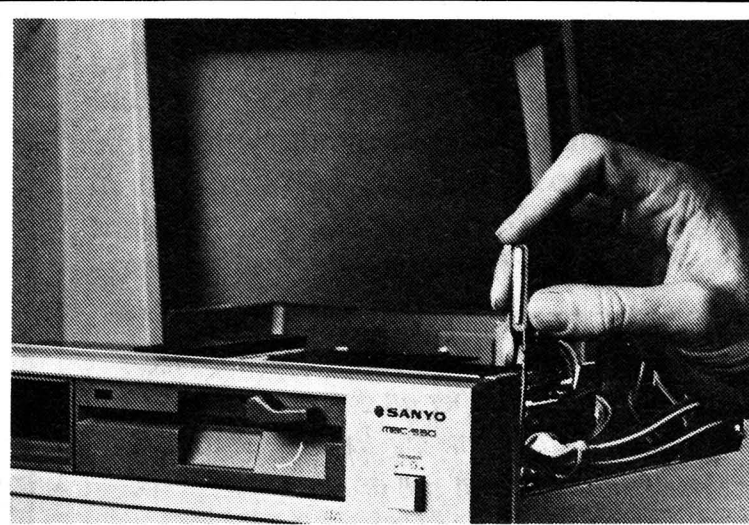
We'll Give You Tomorrow.

IBM is a Registered Trademark of International Business Machine Corporation.

as You Build Your Own Sanyo 880 Computer System.



The power supply is assembled in the main unit of the computer. You check out keyboard connections and circuits with the digital multimeter included for training and field use.



Next, you install the disk drive. You learn disk drive operation and adjustment, make a copy of MS-DOS operating disk and begin your exploration of the 8088 CPU.



Using the monitor, you focus on machine language programming, an indispensable troubleshooting tool for the technician. You continue by learning BASIC language programming.

Try It. Then Buy It. **PC-Write.**[™]

A fast, full-featured word processing package for only **\$16**. Complete. You get a quick reference guide and tutorial on disk, 45 help screens, choice of function keys or menus, mail merge, spelling check, advanced formatting, and support for over 350 printers including the HP LaserJet Plus.

Try **PC-Write** for only **\$16**. Then register for **\$89** to get:

- o Latest diskette pair
- o Hardbound manual
- o Two updates
- o Phone support
- o Newsletter

Plus, your registration fee supports our development of new **PC-Write** features.

Shareware means you can freely copy and share the **PC-Write** diskette.

Register only if you decide to use it. No risk!

Personal
Computing
Mar 1987

Version 2.7 Features

50,000 word *Spelling Checker*.
Clip text from other screens.
Supports Laserjet+ fonts. Site
Licenses now available to
companies and schools.

(This ad was created with **PC-Write**)



Order PC-Write Today.
Satisfaction Guaranteed.

Quicksort[™]

(206) 282-0452
219 First N. #224r
Seattle, WA 98109



(For More Information Circle 187)

PRODUCT LISTINGS

bles a remote caller to operate a distant computer. It incorporates dial-back verification and password security. It is Bell 212A compatible and has auto-dial/auto-answer capability. *AO Electronics, Inc., 2137 Flinstone Drive, Tucker, GA 30084; (404) 491-8044; \$895 retail. (For additional product details, circle 125 on one of the Free Information Cards.)*

INTERNAL DISK CARTRIDGE SYSTEM can be installed in the Tandy 3000 HL or the Tandy 3000 floppy drive system for storage of data on removable cartridges. This is a 5.25-inch, 20Mb system with an average access time of 40 milliseconds. For added storage, a second system can be mounted. Both units can be installed by the user. *Tandy Corp./Radio Shack, 1800 One Tandy Center, Fort Worth, TX 76102; (817) 878-4969; \$1,799 retail; \$999 for a second system; \$84.95 per 5.25-inch disk cartridge. (For additional product details, circle 126 on one of the Free Information Cards.)*

LASERPOWER II 10-page per minute laser printer features 18 resident type fonts and a page description language for the generation of custom forms, business graphics, and bar codes. It has a monthly duty cycle of 15,000 pages and a total printer life of 600,000 pages. Emulations include Diablo 630, Epson FX-80, and the Hewlett-Packard LaserJet. Letter and legal-size 250-sheet input and output trays are included. *CMS, 3080 Airway Ave., Costa Mesa, CA 92626; (714) 549-9111; \$3,995 retail. (For additional product details, circle 127 on one of the Free Information Cards.)*

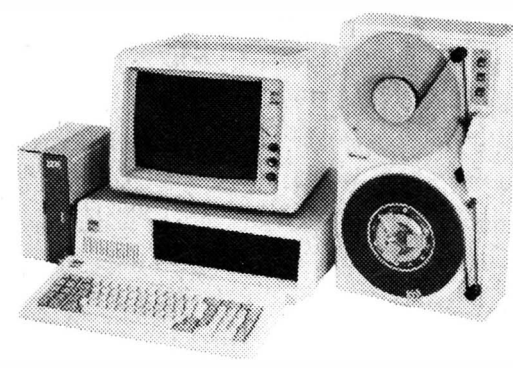
LASERVIEW DISPLAY SYSTEM, comprised of a high-resolution adapter board and a choice of either a 15- or 19-inch monochrome monitor, provides a resolution of 1,664 dots by 1,200 lines. *Sigma Designs, Inc., 46501 Landing Parkway, Fremont, CA 94538; (415) 770-0100; \$2,395 (including 19-inch monitor), \$1,895 (including 15-inch monitor), or \$1,150 for the Display Adapter only; retail. (For additional product details, circle 128 on one of the Free Information Cards.)*

MAYNSTREAM PLUS 20/20 is a portable combination half-height 20Mb tape backup unit and half-height 20Mb hard disk drive. A 20Mb file-by-file backup takes five minutes. The hard disk has an average seek time of 60 milliseconds. The Maynstream Plus runs on its own power supply. *Maynard Electronics, 460 E. Semoran Blvd., Casselberry, FL 32707; (305) 331-6402; \$2,400, PC and XT versions; \$2,200, AT version; retail or direct order. (For additional product details, circle 129 on one of the Free Information Cards.)*

MICROFAZER VI is a six-port printer-sharing device that has the capacity to store often-used printing formats in memory. It can be configured to enable any combination of computers, printers, plotters, and modems to work together (for example, four comput-

For more product information, please circle the appropriate number on one of the Free Information Cards that are located facing the Product Index within the product review section or opposite the Advertiser's Index.

9-Track Tape Subsystem



Now you can exchange data files between your IBM PC/XT/AT and any mainframe or minicomputer using IBM compatible 1600 BPI 9-Track tape. Unit can also be used for disk backup and archival storage. Transfer rate is one megabyte per minute on PCs and 100% compatibles. Subsystems include 7" or 10 1/2" streaming tape drive, tape coupler card and DOS compatible software.

Prices start at \$3,555.

QUALSTAR[®]

9015 Eton Ave., Canoga Park, CA 91304
Telephone: (818) 882-5822

(For More Information Circle 204)



Sure it's insured?

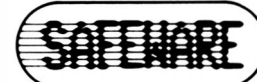
SAFEWARE[®] Insurance provides full replacement of hardware, media and purchased software. As little as \$39/yr. covers:

- Fire • Theft • Power Surges
- Earthquake • Water Damage • Auto Accident

For information or immediate coverage call:

1-800-848-3469

In Ohio call 1-614-262-0559



SAFEWARE, The Insurance Agency Inc.

Taxease FAST 1040 EASY

PROFESSIONAL TAX PREPARATION PACKAGE

- Schedules A, B, C, D, E, G, W, SE, 2106
- Instantly updates on-screen tax forms
- On screen help
- Forms fully integrated
- Prints on forms or plain paper
- Stores, retrieves, changes unlimited

send check or money order for 49.95 + 2.50
shipping/handling to:

T & F ENTERPRISES
8511 PIN OAK DRIVE • PARMA, OH 44130
Ohio residents add 6.5% sales tax.
IBM PC and Compatibles with 256K

ONLY 49.95 !!!

(For More Information Circle 191)

IS GETTING THE ANSWER TO SOFTWARE PROBLEMS A BIGGER PROBLEM THAN THE PROBLEM?

Don't stay on hold when there's help online from CompuServe® Software Forums.



The new upgraded version of your software locks up. And every time you reboot, you get stuck in the same place in the program.

You've chucked the manual, because you've done exactly what it tells you to do six times already. So you call the software company.

Now you spend half a day beating your head against a brick wall of busy signals, ranting at recorded messages, hanging around on hold. And you still don't get the solution to your problem.

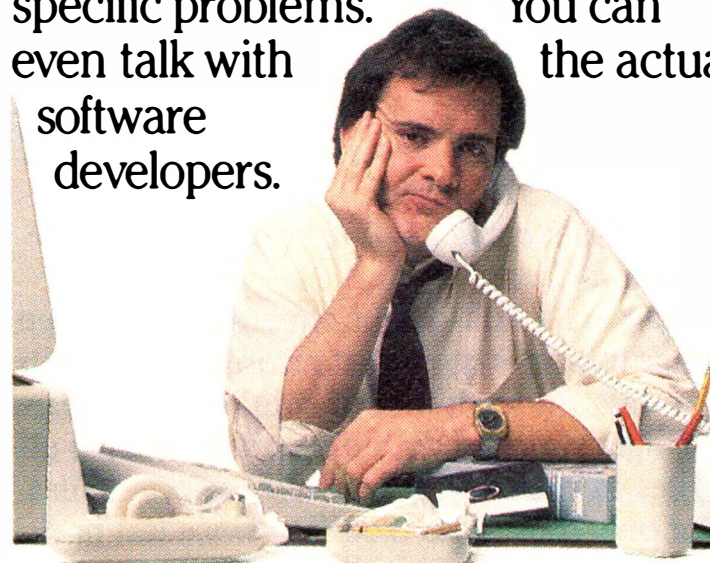
Meanwhile, progress is stopped and your profits are dribbling away. But wait. There's help...

Several prominent, progressive software publishers recognize this problem, and working with CompuServe, have developed a solution—CompuServe Software Forums.

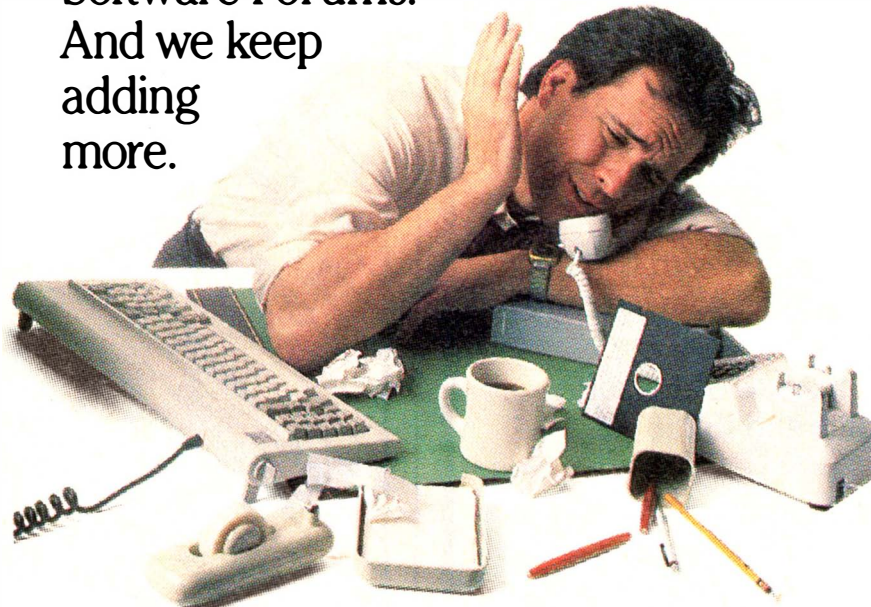
Now you can go online with experts from the companies that produced your software and get



prompt, written answers to your specific problems. You can even talk with the actual software developers.



Aldus®, Ashton-Tate®, Autodesk®, Borland International®, Creative Solutions®, Digital Research®, Living Videotext®, Lotus® Inc., Microsoft®, MicroPro®, Misosys Inc.® and Software Publishing® all have CompuServe Software Forums. And we keep adding more.



CompuServe's large subscriber base also puts you in touch with thousands of other, often more experienced, users of the same software. You'll find they can give you lots of creative ways to get the most out of your software.

And software forums are the best way to learn about product updates, new product announcements, new ways to expand the uses of your software, and offer free uploads of your own programs.

Our online electronic magazines

frequently publish software reviews. And you can find help for many other software products in our other computer-related forums for IBM®, Tandy®, Atari®, Apple®, Commodore®, TI® and others.

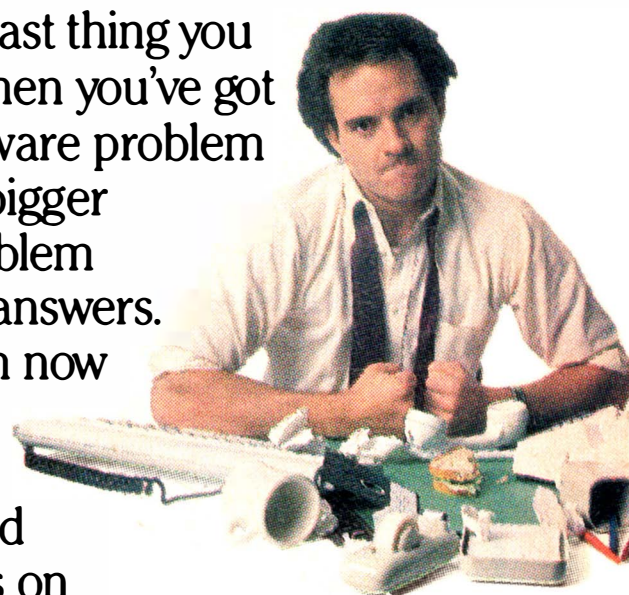
The last thing you need when you've got a software problem is a bigger problem getting answers.

So, from now on, get prompt, informed answers on CompuServe Software Forums.

To buy your CompuServe Subscription Kit, see your nearest computer dealer. Suggested retail price is \$39.95.

To order direct or for more information, call 800-848-8199 (in Ohio, 614-457-0802).

If you're already a CompuServe subscriber, just type GO SOFTWARE at any ! prompt.



CompuServe®

Information Services, P.O. Box 20212
5000 Arlington Centre Blvd., Columbus, OH 43220

An H&R Block Company

(For More Information Circle 100)

PRODUCT LISTINGS

ers with two printers). *Quadram Corp., One Quad Way, Norcross, GA 30093-2919; (404) 923-6666; \$995 retail. (For additional product details, circle 130 on one of the Free Information Cards.)*

MODEL 8CM540 is an EGA monitor using a 14-inch 0.31mm-dot-pitch CRT to produce a resolution of 720 dots by as many as 350 lines. The 64-color display has a non-glare CRT, and green and amber text mode capability. *Magnavox, NAP Consumer Electronics Corp., Interstate 40 and Straw Plains Pike, PO Box 14810, Knoxville, TN 37914-1810; \$750 retail. (For additional product details, circle 131 on one of the Free Information Cards.)*

MOTHERCARD version 5.0, an 80286 board for an IBM PC, XT or compatible, comes with 640k of DOS memory, 320k of EMS memory, a real-time clock, and a socket for an 80287 math coprocessor. To install the unit, the user can move the 8088 from the computer's motherboard to the Mothercard and insert the card into an open slot. The Mothercard is designed to provide full AT compatibility. *Sota Technology, Inc., 657 N. Pastoria Blvd., Sunnyvale, CA 94086; (408) 245-3366; \$995 retail. (For additional product details, circle 132 on one of the Free Information Cards.)*

NB24-15 is a 24-wire dot matrix printer with a draft speed of 180 characters per second and letter quality speed of 60 cps. It emu-

lates the Epson LQ-1000 printer, the IBM Graphics Printer, and the IBM Proprinter. (Qume Sprint 11, Diablo 630 and Toshiba P351 emulations are optional.) A parallel interface is standard, and a touch-pad control panel provides selection of 19 commonly used print and format functions. It also comes with a 15-inch carriage and a built-in font. Other plug-in fonts are optional. *Star Micronics, Inc., 200 Park Ave., Suite 3510, New York, NY; (212) 986-6770; \$1,099 retail. (For additional product details, circle 133 on one of the Free Information Cards.)*

NR-15 9-wire printer prints at 240 characters per second in draft and 60 in NLQ mode. Standard features include Epson FX-85, IBM Graphics Printer, and IBM Proprinter emulations, a parallel interface, a 16k buffer, friction and rear tractor feeds, and a 15-inch carriage. *Star Micronics, Inc., 200 Park Ave., Suite 3510, New York, NY 10166; (212) 986-6770; \$799 retail. (For additional product details, circle 134 on one of the Free Information Cards.)*

OSIBAK is a half-height streaming cartridge tape backup system that records up to 40Mb of data on front-loaded minidata tape cartridges supplied with the unit. It records all files in memory, specifically selected files, or only those files modified since last backup. Backup speed is 2Mb of data per minute. *Osicom Technologies, 198 Green Pond Road, Rockaway Township, NJ 07866; (201)*

586-2550; \$473, XT version; \$502, AT version; retail. (For additional product details, circle 135 on one of the Free Information Cards.)

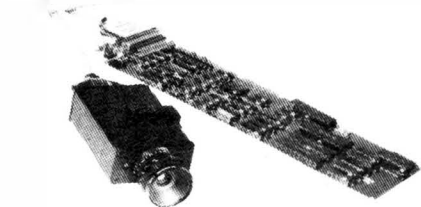
OSICARD is a 3.5-inch hard disk on a card in 20- and 30Mb configurations that fits in the short slot nearest the fan for maximum cooling. It has an access time of 65 milliseconds. *Osicom Technologies, 198 Green Pond Road, Rockaway Township, NJ 07866; (201) 586-2550; \$484, 20Mb; \$526, 30Mb; retail. (For additional product details, circle 136 on one of the Free Information Cards.)*

OVERDRIVE 40 is a 40Mb internal SCSI hard disk drive for the Macintosh. It has an access time of 29 milliseconds; four software utilities are included. *Levco, 6160 Lusk Blvd., Suite C-203, San Diego, CA 91212; (619) 457-2011; \$2,699 retail. (For additional product details, circle 137 on one of the Free Information Cards.)*

QC-PGA is a professional graphics adapter that enables you to draw schematics, diagrams, and designs in high-resolution color, in addition to two- and three-dimensional images. Features include modeling, viewing transformations, command lists, color manipulation, and programmable text fonts. It can emulate MGA, HGA, and CGA, and comes with PGA-mode utility software. The adapter has a 16-bit 80286 microprocessor and uses 512k of RAM. It will simultaneously display 256 colors from a palette of

IDETIX™

DIGITAL CAMERA MOS Imaging System



System Includes:

MOS sensor based, IBM PC compatible camera with C-Mount lens. High speed controller board. Demonstration software and subroutine library.

Adjustable frame size and resolution to 1024 x 512 pixels using the MOS digital image sensors, IS32A and IS256 OpticRAM™

Rugged and reliable camera head for industrial environments. The high speed differential driver/receiver camera head measures 4.3"L x 1.5"H x 3"W.

MACHINE VISION APPLICATIONS INCLUDE:

FACTORY INSPECTION	PROCESS CONTROL
ROBOTICS	MANUFACTURING AUTOMATION
REPROGRAPHICS	SIGNATURE VERIFICATION

UNDER \$500 IN OEM QUANTITIES.

Micron Technology, Inc., a world leader in semiconductor development and manufacturing, presents the IDETIX™ Imaging System, a low cost alternative for machine vision applications.

Distributor Inquiries Welcome

For more
information contact:

MICRON
TECHNOLOGY, INC.
Systems Group
2805 E. Columbia Road
Boise, Idaho 83706
(208) 386-3800

(For More Information Circle 186)

PROF JONES
SUMMER/FALL 1987
ORDER LINE
(208) 342-6939
THOROUGHBRED
GREYHOUND
HARNESS
LOTTERY/LOTTO
FOOTBALL
BASKETBALL
OFFICE HOURS
M-F 8 AM - 5 PM
SAT 9 AM - 1 PM
(Mountain Standard Time)
FREE CATALOG
1940 W. STATE
BOISE, IDAHO 83702
VISA
AMEX

PROFESSIONAL HANDICAPPING SYSTEMS

PROFESSIONAL SERIES™
PROFESSIONAL HANDICAPPING TOOLS from PROF. JONES

The New PROFESSIONAL SERIES™ "Software for the Serious Handicapper"
Our all new Professional Series™ represents the most advanced software available for handicapping Thoroughbred, Greyhound, and Harness racing.

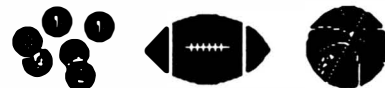


• **Analysis Module™** \$249.95
The most complete and comprehensive bet analysis package available. This module is fast, powerful and easy to use. Full 50 tracks/kennels/etc. Analyzes race variables and recommends best bet strategies.

• **Multiple Regression Module™** \$149.95
Complete control over all program variables. Regresses out factors relating to winning animals and then automatically re-calculates the weighting formula as successive races are analyzed to derive the most precise formula possible!

• **Database Management Module™** \$149.95
Automatic storage of last ten races of all animals for inclusion into current race analysis. Higher win percentages due to more information. (\$99.95 if purchased with Multiple Regression Module™).

Other specialized handicapping programs:



LOTTERY:
Advanced statistical analysis programs with proven number selection systems like R. Hard's 6-Digit Permutation, Dimitrov, and others!
Statistical Lottery Analysis™ \$99.95
Enhanced Lottery/Lotto Analysis™ \$129.95
Professional Lottery Analysis™ \$149.95

FOOTBALL:
Complete football statistical prognosis of game scores, points spread, best bet, etc. Win/loss power ratings, previous four game analysis, multiple prediction results, and more!
Football Predictor™ \$99.95
Football Addition™ \$149.95
Professional Series Football™ \$199.95
Bookie Buster™ Football Analysis \$149.95

BASKETBALL:
Predict game results based on team strength ratings, past games stats analysis, etc. Evaluates avg. points scored, avg. points given up, wins/losses, point spreads, wild cards, & more!
NBA Basketball Analysis™ \$99.95
Basketball Addition™ \$149.95

And many more programs available, call for a copy of our catalog!

Handicapper's Bulletin Board now available. The Prof's NFL & NBA weekly picks! Call for hrs. & Ph. #. / Master Handicapper™ VHS training tapes available. Learn handicapping faster and easier! / Portable PC's w/built-in handicapping software available. Call for more information.

Terms: Free shipping all software. Add \$6.00 COD / \$6.00 UPS Blue / \$9.00 International delivery / ID residents add 5%. Allow 3 weeks when paid by personal check. Prices above are for cash or money order only. Add 3% for Visa, MasterCard, and AMEX. Prices subject to change.

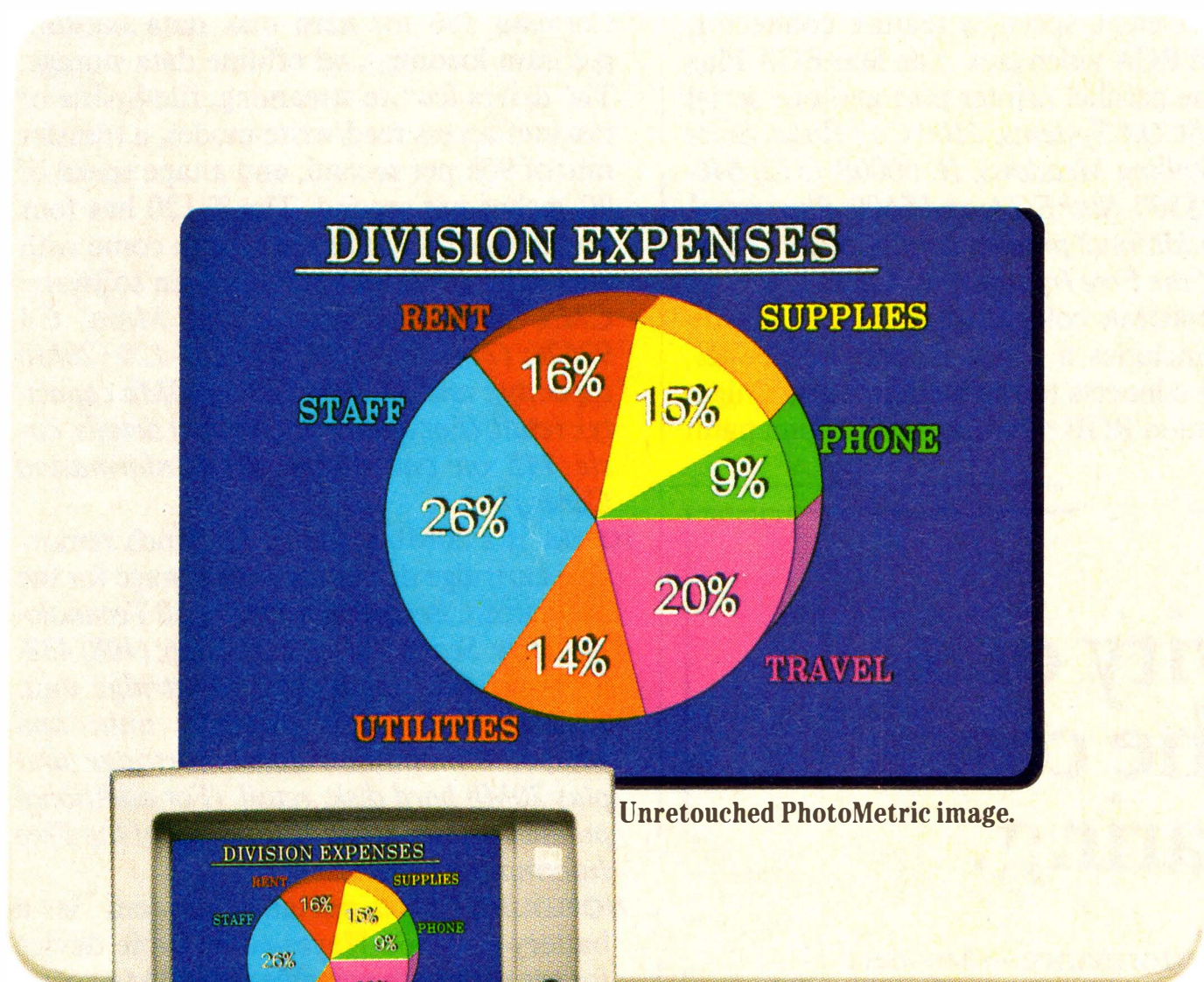
(For More Information Circle 156)

NEW

PhotoMetric 200TM

THE LEADING

DESK TOP SLIDEMAKER



TERRIFIC SLIDES FROM POPULAR SOFTWARE.

Use any popular graphics package like Lotus Freelance,TM Microsoft Chart 2.0,TM Ashton-Tate Chart-Master,TM our popular PictureItTM and many more. Call for the list.

2000 x 2000 RESOLUTION SLIDES IN 1000 BRILLIANT COLORS.

Everything you need: PhotoMetric 200 Desktop Film Recorder, PC Board and PhotoMetric software. All for \$5995.

FIND OUT ABOUT IT. Call 1-800-556-1234, Ext. 533. In California, call 1-800-441-2345, Ext. 533. Or write 1250 Ninth Street, Berkeley, CA 94710.

General Parametrics Corporation

the makers of VIDEOSHOWTM

(For More Information Circle 6)



Also available: PhotoMetric 200VS for use with VideoShow 160.

VideoShow, PhotoMetric and PictureIt are trademarks of General Parametrics Corporation. Freelance and Lotus are registered trademarks of Lotus Development Corp. Chart 2.0 is a trademark of Microsoft. ChartMaster is a trademark of Ashton-Tate. IBM is a trademark of International Business Machines Corp.

PRODUCT LISTINGS

4,096 colors. *QIC Research, Inc.*, 753-755 Ames Ave., Milpitas, CA 95035; (408) 942-8086; \$995 retail. (For additional product details, circle 138 on one of the Free Information Cards.)

6408 is an eight-page-per-minute laser printer that can print bar codes, and includes 14 resident fonts. It has a 250-page input tray and 250-page collated output. The 6408 has a 300-by-300-dots-per-inch matrix print-head, and can handle portrait, landscape, and condensed printing. *Decision Data Computer Corp.*, 400 Horsham Road, Horsham, PA 19044-0996; (215) 674-3300; \$5,495 retail. (For additional product details, circle 139 on one of the Free Information Cards.)

SL-80AI 24-pin printer emulates the Epson LQ-1500 and IBM Graphics Printers, and has a draft speed of 135 characters per second and a letter quality speed of 45 cps. Features include friction/adjustable tractor feed, front panel left/right margin setting, automatic single-sheet loading, and a 10-inch carriage. *Hattori Seiko Computer Peripherals*, 1111 MacArthur Blvd., Mahwah, NJ 07430; (201) 529-4655; \$549 retail. (For additional product details, circle 140 on one of the Free Information Cards.)

SMART EGA is a half-size enhanced graphics adapter board compatible with EGA, CGA, and MDA, as well as the HGC (Hercules Graphics Controller) display mode, that provides a resolution of 750 by 350 pixels.

The Smart EGA is designed to work in any mode with any standard enhanced color display. With the "mode save" feature, users select the display mode through keyboard commands. The "palette save" feature enables users to specify the colors of text and graphics applications from a 64-color palette to keep chosen colors active even after a warm reboot of the computer. *NSI Logic, Inc.*, Cedar Hill Business Park, 257-B Cedar Hill Road, Marlboro, MA 01752; (617) 460-0717; \$549 retail. (For additional product details, circle 141 on one of the Free Information Cards.)

STAR EGA and **STAR EGA PLUS** are enhanced graphics adapters compatible with EGA, CGA, MDA, and HGA, displaying 640-by-350-pixel resolution in 16 colors from a palette of 64. They include 256k on-board DRAM for screen buffering, flicker-free panning and scrolling, selectable 4.77/6/8/10MHz clock speed, a feature connector, and an RCA video jack. The Star EGA Plus has one parallel printer port and one serial port. *SCOA Systems*, 2100 Golf Road, Suite 100, Rolling Meadows, IL 60008; (312) 640-8798; \$500, Star EGA; and \$600, Plus; retail. (For additional product details, circle 142 on one of the Free Information Cards.)

SUPERCHROMA color display for the Macintosh includes a video display controller, which connects to the modem port, a high-resolution RGB monitor, and Chromapaint

software. It has a 68000 processor and display coprocessor, one million pixels of available display memory, 640 by 480 pixel resolution, and 256 simultaneous colors from a palette of 262,144. *Computer Friends*, 14250 NW Science Park Drive, Portland, OR 97229; (503) 626-2291; \$2,995 retail. (For additional product details, circle 143 on one of the Free Information Cards.)

2400VP modem operates at 2400, 1200, or 300 bits per second synchronously or asynchronously. It provides MNP error control, speed conversion, an automatic voice-to-data switching circuit, front panel control, and non-volatile memory. *Racal-Vadic*, 1525 McCarthy Blvd., Milpitas, CA 95035; (408) 946-2227; \$595 retail. (For additional product details, circle 144 on one of the Free Information Cards.)

T-120 and **T-160** are add-on tape drives compatible with the IBM PC XT 286 and the Compaq 386 for hard disk data backup, program loading, and off-line data storage. The drives feature streaming, file-by-file or random access read/write modes, a transfer rate of 90k per second, and a tape speed of 90 inches per second. The T-120 has four tracks, the T-160 has nine. Both come with controller cards and menu-driven software. *CMS*, 3080-A Airway, Costa Mesa, CA 92626; (714) 549-9111; \$995, T-120 (20Mb capacity); and \$1,595, T-160 (60Mb capacity); retail. (For additional product details, circle 145 on one of the Free Information Cards.)

TOTEM is a 20Mb series of 5.25-inch removable cartridge drives for data storage for the Macintosh. *Bering Industries*, 250 Technology Circle, Scotts Valley, CA 95066; (408) 438-8779; \$1,495, single 20Mb cartridge unit; \$2,295, dual 20Mb cartridge unit; and \$2,295, combination 20Mb cartridge unit plus 20Mb hard disk; retail. (For additional product details, circle 146 on one of the Free Information Cards.)

WORLDLINK 1200 portable modem is a battery-powered Hayes-compatible device for use with both portable and desktop computers. It has 300/1200-bits-per-second operation, auto dial/auto answer, pulse/tone dialing, and an acoustic coupler interface for 300- and 1200-bits-per-second operation. *Touchbase Systems, Inc.*, 16 Green Acre Lane, Northport, NY 11768; (516) 261-0423; \$199 retail or direct order. (For additional product details, circle 147 on one of the Free Information Cards.)

ZOOM/MODEM PC 2400 includes call progress tone detection, "demon dialing" of busy numbers, audio input and output ports, support for four COM ports, and a high-speed 16450 UART for compatibility with AT compatibles. It supports 2400-, 1200-, and 300-bits-per-second standards. *Zoom Telephonics, Inc.*, 207 South St., Boston, MA 02111; (617) 423-1072; \$499 retail. (For additional product details, circle 148 on one of the Free Information Cards.)

ZVM-1380 is a 13-inch color monitor with EGA compatibility. When combined with an EGA card, the monitor is capable of displaying up to 64 colors (16 at a time) and a resolution of 640 horizontal dots by 350 ver-

The connectivity of a network for the cost of printer sharing.

Crosspoint 8: The elegant connection solution for IBM PC and compatible products.

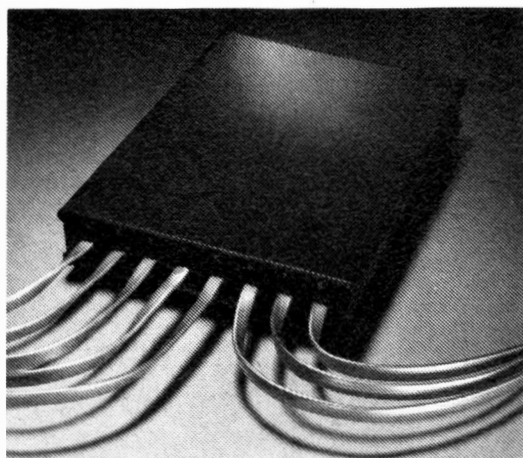
Flexible—Connect any combination of 8 PCs, printers, plotters, or modems. Any device to any other. As your system grows, change or add to the network in minutes.

Simple—Simple pop-up windows set up the network and give each PC easy access to all devices. Telephone-type cabling (included) makes installation easy.

High Performance—Any data rate, on all channels, and no speed degradation because of system load. Perfect for lasers, plotters, and PC-to-PC transfers.

Economical—Less than \$75 per port (suggested retail) complete with cables and modular adaptors for 8 devices.

For more information or to order call: 1-800-232-7729.



Crosspoint Systems

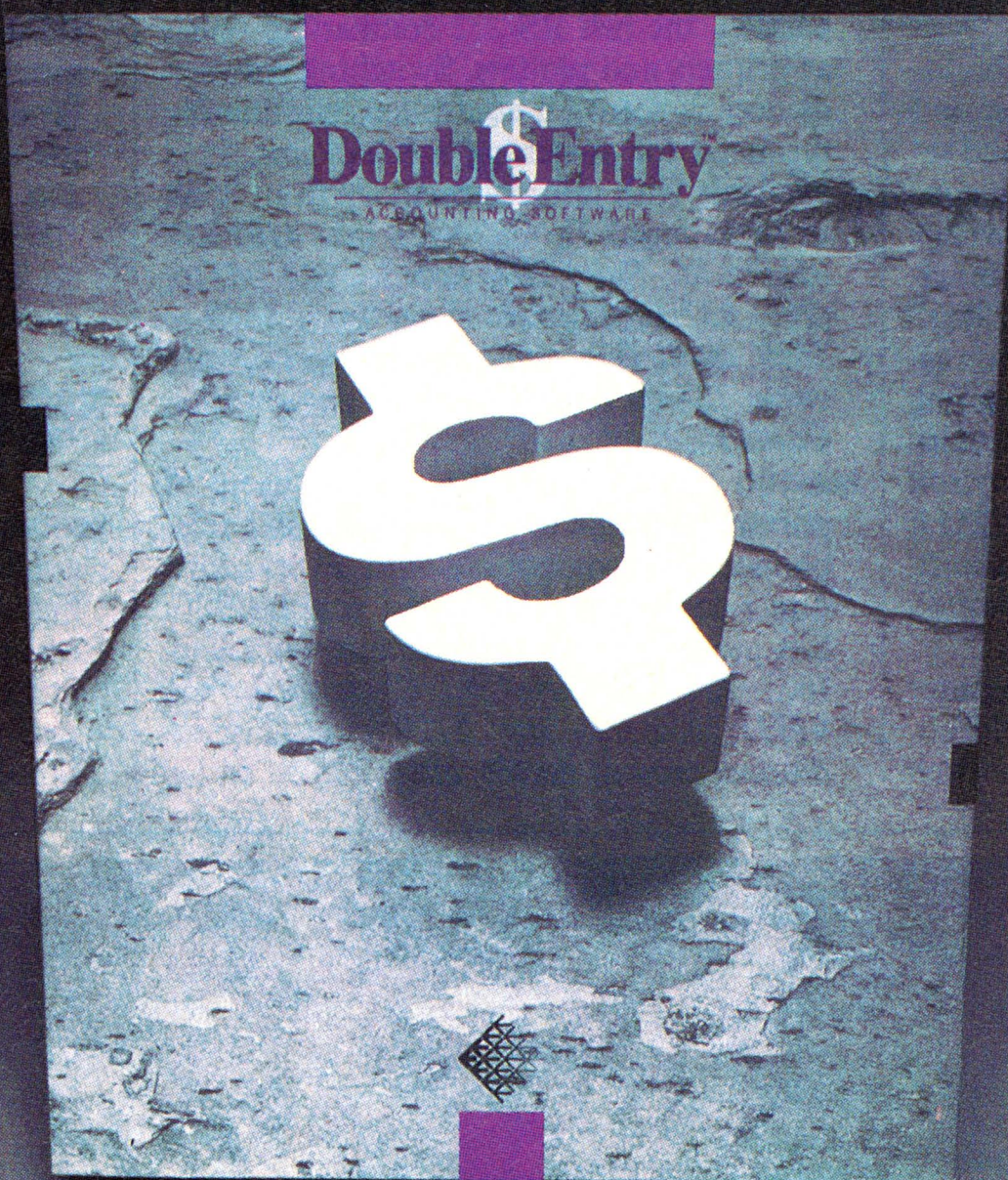
1710 Willow Creek Circle
Eugene, OR 97402
1-800-232-7729
(503) 485-4254

(For More Information Circle 205)

DoubleEntry

Your Window to the Future!

NOW With Payroll



11/28/85 DOUBLE ENTRY—Customer Invoicing/Billing
Version 1.30-10/26/85

Customer ID: _____ Next Invoice: _____

Bill to: Address _____ _____ _____	Purchase Order Number: _____ Invoice Date: _____ Salesman: _____
Ship to: Address _____ _____ _____	Shipping Instructions: _____ F.O.B.: _____ Taxable: _____ Terms Code: _____ Note Number: _____

Enter Customer ID
F1 Display Customer F2 Add Customer F7 Select Document F9 Menu F10 Exit

Accounts Receivable Invoicing

11/28/85 DOUBLE ENTRY—Customer Invoicing/Billing
Version 1.30-10/26/85

Customer ID: _____ Customer Add: _____

Bill to: Address _____ _____ _____	Customer ID: UNITED Customer Name: United Data Address Line1: 1375 W. Mary St. Address Line2: Suite 32 City & State: Mt. View, CA. Zip Code: 94043 SlsAcct Code: 1 Sales Tax Rate: _____ Discount Rate: _____ Customer Rate: _____ Dunning Flag: _____ Finance Charge: _____ Term Code: _____
Ship to: Address _____ _____ _____	

Enter a Sales Account Code (1 to 8)
F1 Display SlsAcct Code F2 Stop Entry

Add A Customer During Invoicing

11/28/85 DOUBLE ENTRY—Customer Invoicing/Billing
Version 1.30-10/26/85

Customer ID: _____ Customer Add: _____

Bill to: Address _____ _____ _____	Customer ID: UNITED Customer Name: United Data Address Line1: 1375 W. Mary St. Address Line2: Suite 32 City & State: Mt. View, CA. Zip Code: 94043 SlsAcct Code: 1 Sales Tax Rate: _____ Discount Rate: _____ Customer Rate: _____ Dunning Flag: _____ Finance Charge: _____ Term Code: _____
Ship to: Address _____ _____ _____	

Code	Account on Posting Table
1	Account: 5001 Dept: 10
2	Account: 5101 Dept: 20
3	Account: 5202 Dept: 30
4	Account: 5303 Dept: 40
5	Account: 5404 Dept: 50

Press ← to Continue List
F1 Continue Entry F2 Restart Listing

A New Generation of Accounting Software

Designed for your PC by people with experience in over 30,000 accounting installations.

We've taken advantage of the latest hardware and programming technology to bring you a lightning fast fully integrated system of accounting modules.

Double Entry™ uses the windowing concept extensively, making your access to key information fast and easy. No more searching through stacks of paper, its as close as a keystroke.

Ideal for the first time or experienced user. Either way we offer 90-days of free telephone support.

Preview the View!

Send \$5* along with this coupon to Systems Plus, Inc., Attention: Preview.

Name _____
Address _____
City _____ State _____
Phone _____

☐ Visa/Mastercard ☐ Check enclosed
Number _____ Exp. _____

*Includes for a limited time only a \$25 certificate towards your first purchase.

Double Entry A New View of Accounting

For a self running interactive demo and sample reports book, mail the adjacent coupon and \$5.00 to:

Systems Plus, Inc.™
500 Clyde Avenue
Mountain View, CA 94043
415/969/7047



System Requirements:

IBM PC/XT™ or AT™ or IBM compatible. PC-DOS™ or MS-DOS™ operating system. 256K internal RAM memory and hard disk. A printer capable of printing 132 columns.

PRODUCT LISTINGS

tical lines. In EGA mode, it displays an 8-by-14-dot character cell with a .31 millimeter dot pitch. With a CGA card, it displays 640-by-200 resolution with an 8-by-8-dot character cell. It features a non-glare screen and a text color control that provides a choice of white, green, or amber text. *Zenith Data Systems, 1000 Milwaukee Ave., Glenview, IL 60025; (312) 391-8860; \$799 retail. (For additional product details, circle 149 on one of the Free Information Cards.)*

MISCELLANEOUS

DOT MATRIX CLEANING KIT eliminates build-up of ink, dust, lint, and machine-generated debris on the print heads of printers, and reduces static electrical charges. Each kit contains a 1-ounce printer/plotter/typewriter cleaning agent; print element cleaning material; one 4-ounce spray can of "Air Clear" for cleaning rollers, tractors, and ribbon assemblies; and six office equipment cleaning pads and ink cleaning pads to clean equipment exteriors. *Networx, 203 Harrison Place, Brooklyn, NY 11237; (718) 821-7555; \$29.95 retail. (For additional product details, circle 150 on one of the Free Information Cards.)*

EC15 is a surge-protected personal computer table with an adjustable top shelf and adjustable work surface. An on/off switch

under the 36-inch-wide by 24-inch-deep work surface controls all the components plugged into the EC15's four grounded outlets. All four outlets have interference suppression and are surge protected, and the entire electrical assembly is protected with a 10-amp circuit breaker. *Bretford Manufacturing, Inc., 9715 Soreng Ave., Schiller Park, IL 60176; (312) 678-2545; \$292 retail. (For additional product details, circle 226 on one of the Free Information Cards.)*

THE JUGGLER is a print/plot buffer that will queue RS-232 output from one to four computers to two to five output devices—one parallel, the rest RS-232 compatible—such as printers and plotters. Switching between devices is software controlled, eliminating the need for switching mechanisms. It is available with internal memory from 256k to 768k. *Jewell Technologies, Inc., 4302 SW Alaska St., Suite 207, Seattle, WA 98116; (206) 937-1081; prices range from \$649 to \$899, retail. (For additional product details, circle 227 on one of the Free Information Cards.)*

MA-100 MODEM ADAPTER enables users of portable laptops to use non-modular telephones. It is compatible with all standard direct-connect modems and enables 300-bits-per-second communication. *Novation, Inc., 20409 Prairie St., Chatsworth, CA 91311; (213) 996-5060; \$129 retail. (For additional product details, circle 228 on one of*

the Free Information Cards.)

SCOOTER MODEL SP500M is a monitor stand with electrical power protection built into the base. It has locking tilt and full-swivel capabilities, and is designed for use with any monitor or an Apple Macintosh. Five protected and switchable sockets are provided to enable an interface to other peripheral equipment. *Scooter Products, Ohm/Electronics, Inc., 746 Vermont St., Palatine, IL 60067; (800) 323-2727; \$79.95 retail. (For additional product details, circle 229 on one of the Free Information Cards.)*

TURBO MOUSE is a trackball for the Apple IIe, IIc, and Macintosh. The device, in essence a mouse turned upside down, is 40 percent faster than a standard mouse, according to the manufacturer. *Kensington Microware, Ltd., 251 Park Ave. South, New York, NY 10010; (212) 475-5200; \$129.95 retail. (For additional product details, circle 230 on one of the Free Information Cards.)*

PRODUCTIVITY

BUSINESS STRATEGIST is a simulation/strategy application that enables the user to model business situations by entering information on any company's operations, competitors, and market environment, and then devising real strategies for competition. Business Strategist includes case histories from the

*"One of the niftiest
programs I've seen...
It's a fast, easy-to-use
but sophisticated program."*

JIM SEYMOUR,
PC Week, June 24, 1986

TVTMVALUETM VERSION 2.0

Loan Amortization and Compound Interest Computations

- Now with compounding periods from daily to annual and ability to save input data to disk.
- Solves for unknown present or future value, payment amount, number of payments, or interest rate. Handles fixed-payment-to-principal, interest only, skip-payment, irregular-payment and conventional loans. Supports balloon payments, multiple interest rates, rule of 78, odd days, and more.
- Nationally licensed by Ernst & Whinney, KMG Main Hurdman, Laventhol & Horwath, and others.
- Unconditional 30-day guarantee.
- \$95. VISA, MC or we'll bill you.



TimeValue Software • 14771 Plaza Drive, Suite K
Tustin, CA 92680 Phone (714) 731-9214

(For More Information Circle 195)



Quality Products You Can Depend On

Introducing the New MACH IV JOYSTICK It saves you Time, Space and Money

CH Products new MACH IV JOYSTICK is two controllers in one. A high-precision mouse replacement and joystick combined. This means you can use it with any program that requires a mouse or with any program that requires a joystick.

The **MACH IV saves you time** because it is faster and easier to use than a mouse. It also doesn't require cleaning every 10 hours like most mechanical mice.

The **MACH IV saves you space** because it doesn't require any desk space or special surfaces to operate. You can even use it on your lap.

The **MACH IV saves you money** because it costs less and provides a longer life expectancy than a common mouse. And with the flip of a switch you have the added advantage of a joystick control for use with your favorite game or simulation program.

It **works better** and is compatible with **more software** than any other pointing device available today. Try it yourself and we're sure you will agree that the MACH IV JOYSTICK is the **best cursor control available today**.

Available for the Apple IIE/IIC, Macintosh, IBM PC/XT/AT and compatibles. The MACH IV for the IBM PC/XT and AT is a direct replacement for the PC Mouse from Mouse Systems, and is available with Designer Pop-up™ Menus for use with: Lotus 1, 2, 3; Multiplan; VisiCalc; FlashCalc; SuperCalc; WordStar; MultiMate; Volkswriter; Personal Editor; PFS:Write; DBASE II; Framework and Symphony. There is even a Microsoft Mouse driver. This means the MACH IV will work with hundreds of programs that support either a Mouse Systems' or Microsoft mouse.

Suggested Retail:

MACH IV	Apple IIE/IIC	\$ 89.95
	(Apple IIE computer requires an Apple mouse card)	
MACH IV	Macintosh (works as a mouse only)	\$ 89.95
MACH IV	for IBM PC/XT/AT and compatibles	\$119.95
MACH IV	for IBM PC/XT/AT and compatibles with Designer Pop-up™ Menus	\$139.95

MACH II and MACH III Joysticks

are the **number 1** choice of retailers and consumers today. They provide **more features, longer life cycles and greater precision** than all others. With compatibility across a wider range of programs — from games to business to graphics to cad applications. With high quality metal connectors now standard on all models, they are plug in compatible with the Apple II, IIE/IIC, IBM PC/XT/AT, IBM PCjr and most compatibles. Suggested Retail: MACH II — \$44.95; MACH III — \$54.95

GAMECARD III

is our newest game control adapter. It **corrects the incompatibilities** of software programs requiring different joystick outputs. It is the **only game adapter** which provides three switch selectable sensitivities to **function properly** with all game, graphics and cad software for the IBM PCs and compatibles. Available with **optional Y cable** for dual control. The GAMECARD III PC model is compatible with the IBM PC, XT, Portable, Compaq, Leading Edge and most compatibles. The GAMECARD III AT model is compatible with the IBM AT and most compatibles. Suggested Retail: GAMECARD III

GAMECARD III	\$59.95
GAMECARD III with optional Y Cable	\$69.95
Y Cable separately	\$14.95

CH Products, the leading manufacturer of precision analog joysticks for industry and home delivers the highest quality computer peripherals available today.

SEE YOUR DEALER TODAY

or for credit card orders call:

1-800-624-5804

1-800-262-2004 (In California)

for more information call:

(619) 744-8546

1225 Stone Drive,
San Marcos, California 92069



A Joystick Technologies Inc., Company

(For More Information Circle 90)

CLONEWARE™

for PC-AT/XT Compatibles and IBM too!

DeskTalk

*Memory Resident!

- Address Book*
- Calendar*
- Communications
- Phone Dialer*

- **CALENDAR*** – maintains and prints daily, weekly and monthly appointments for all 24 hours of every day.
- **ADDRESS BOOK*** – organizes, sorts, indexes, searches and prints names, addresses, phone numbers, notes and more.
- **PHONE DIALER*** – automatically dials phone numbers and long distance prefixes for you.
- **COMMUNICATIONS** – fully Hayes compatible; allows you to send and receive information quickly and easily.

Non-resident versions also included.

\$59.95

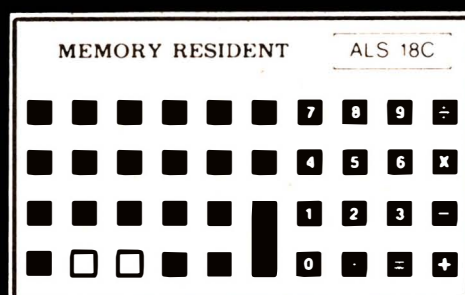
ALS18C Financial Consultant

This easy to use, menu-driven program runs as a **memory-resident** “pop-up”, providing instant access to your calculator even while you are using another program.

- Internal Rate of Return
- Loan Amortization
- Break Even Analysis
- Buying vs Leasing
- Discounted Cash Flow
- Savings and Annuities
- Real Estate
- Depreciation
- Statistics
- Leasing
- Percentages
- Simple Interest
- IRA
- Dates
- Bonds
- Investments

SCIENTIFIC CALCULATOR

- computes log, sine, cosine, pi, tangent, inverse, square root, exponents and more in either decimal or hexadecimal notation.



\$89.95

Non-resident version also included.

See your dealer or order direct from ALS

____ ALS18C Financial Consultant		____ DeskTalk	
Name _____		Day Phone _____	
Address _____			
City/State/Zip _____			
Check One: ☐ VISA ☐ MasterCard ☐ American Express ☐ Check ☐ Moneyorder			
Card # & exp. _____			
TOTAL ENCLOSED: \$ _____			
Signature (required for credit card orders) _____			
California residents add 7% sales tax.			
SEND TO: Advanced Logic Systems, 1283 Reamwood Ave, Sunnyvale, CA 94089 or call us to order by phone. Orders outside US add \$10.00.			

Advanced Logic Systems, Inc.

1283 Reamwood • Sunnyvale, CA 94089 • 408 / 747-1988

PRODUCT LISTINGS

following industries: computers, oil and gas, brewing, automotive, and pharmaceutical. The memory requirement is 384k. *Reality Technologies, 3624 Market St., Philadelphia, PA 19104; (800) 346-2024; \$249.95 retail. (For additional product details, circle 235 on one of the Free Information Cards.)*

CASH DRAWER is a point-of-sale accounting package. The package is designed to handle the needs of a retail business, including sales, rentals, and services, such as time/billing or repairs. According to the manufacturer, the program has all the speed, data file size, and compatibility advantages inherent in a compiled dBase III program. Standard and advanced reports are programmed in. In addition, a full-feature custom report generator is provided. DBase III can be used to generate custom reports or analyses. Features of the program include four levels of password security, and bar menus. The memory requirement is 384k. *Computer Product Introductions Corp., 2127 Bellevue Way SE, Bellevue, WA 98004; (206) 451-9788; \$1,295 retail. (For additional product details, circle 236 on one of the Free Information Cards.)*

CONTACT is a client/contact list management data base featuring prompts and nested menus that can be invoked with single-key commands. Features of the program include the ability to: classify contacts by 22 menu-supplied type categories; create and print custom letters or memos; print labels for contacts by type and in zip code order; and track client/contact addresses, phone numbers, products, or services. All items can be retrieved, added to, edited, or deleted. The memory requirement is 320k; a hard disk is recommended. *Frontline Publications, PO Box 1104, El Toro, CA 92630; (714) 837-6258; \$69 retail. (For additional product details, circle 237 on one of the Free Information Cards.)*

dANALYST version 6.0, a programming utility, is designed to convert single-user dBase III programs to multiuser dBase III Plus programs. The program supports multiuser networks including Clipper, dBase III Plus, FoxBase, and the network version of the WordTech compiler. Features of the program include: Backup Tree of PRG, an option used to create batch programs that copy source programs from a subdirectory; Backup Tree of DBF, used to isolate and back up all the data files, referenced by application; Hierarchial Chart, lists in hierarchial format for all modules of an application; high bit strip, which removes the high bit from the ASCII character codes within a file; Module VAR CrossRef, which produces a table of all the variables for a particular module; and printer modes, in which the printer control codes can be dialed for compressed print on nonstandard printers. The memory requirement is 70k with color graphics, 50k with monochrome; retail. *Transec Systems, Inc., 220 Congress Park Drive, Suite 200, Delray Beach, FL 33445; (305) 276-1500; \$74.95 retail. (For additional product details, circle 238 on one of the Free Information Cards.)*

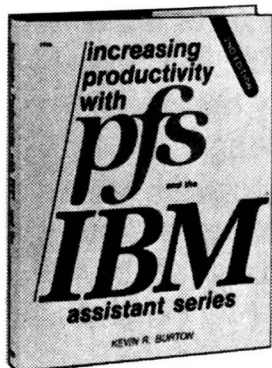
DBMAN-MAC is a data base management package for the Macintosh. The program of-

Increase your knowledge about all aspects of computers

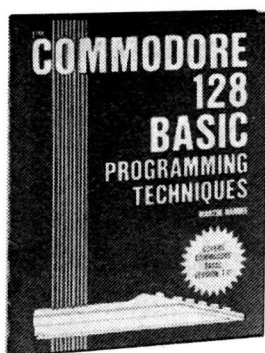
An absolutely no-risk guarantee.

Select 5 Books for only \$2⁹⁵

More programs, projects, and ways to use your micro.
Keep well-informed about the latest books available—and get the *original publishers' editions* at discounts of up to 50% off the publishers' prices!



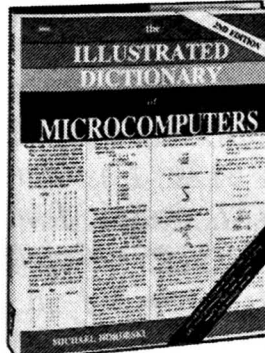
2729 \$22.95



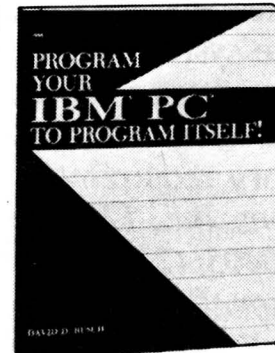
2732 \$18.95



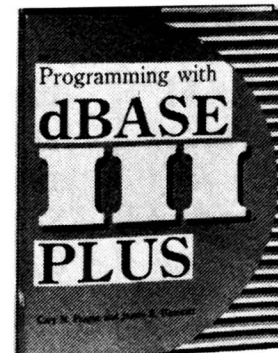
1718P \$15.50



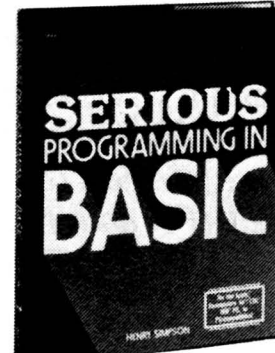
2688 \$24.95



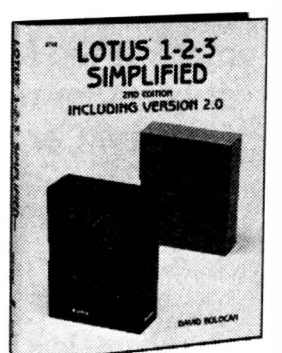
1898P \$12.95



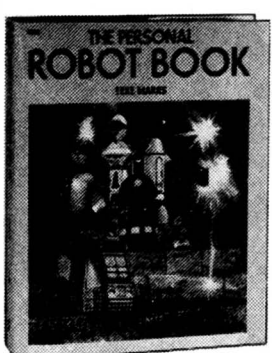
2726 \$29.95
Counts as 2



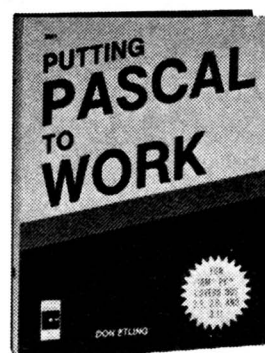
2650 \$21.95



2748 \$21.95



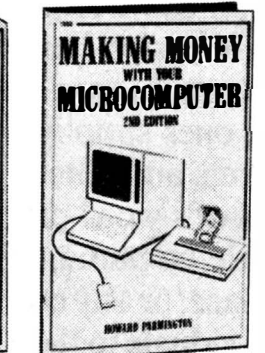
1896 \$21.95



2691 \$23.95



2618P \$21.95



1969 \$16.95



BUSINESS SOFTWARE

1993. Inside Secrets of Word-Star® 2000 and 2000 Plus \$21.95

2623. Multimate® User's Guide \$21.95

1976P. Programming with dBASE III® Paper \$17.95



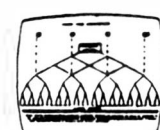
PROGRAMMING TECHNIQUES

1970. True BASIC® —A Complete Manual \$22.95

1798. Teach Your TRS-80™ To Program Itself! \$16.95

1085P. 24 Tested, Ready-To-Run Game Programs in BASIC Paper \$10.25

2627. Turbo Pascal® Programming, with Applications \$23.95

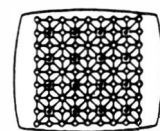


GAMES & GRAPHICS

1768. Programming Your Own Adventure Games in Pascal \$19.95

2640P. Commodore 64™ /128™ Graphics and Sound Programming —2nd Ed. Paper \$14.95

1876P. Getting Great Graphics Paper \$17.95



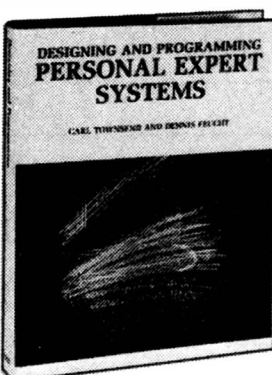
GENERAL INTEREST

1807. The Personal Computer Investment Handbook \$17.95

2622. Supercomputers of Today and Tomorrow: The Parallel Processing Revolution \$21.95

1882. Buyer's Guide To Modems And Communications Software \$19.95

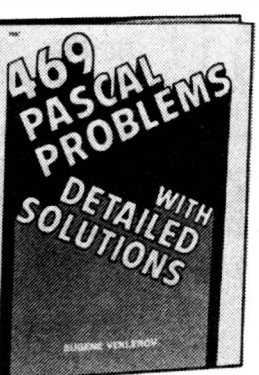
(Publishers' Prices Shown)



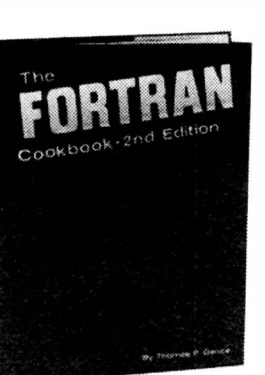
2692 \$27.95
Counts as 2



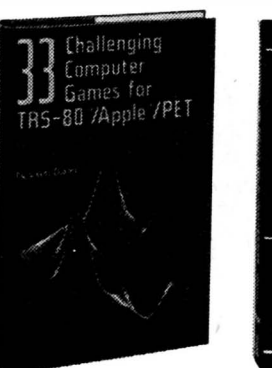
1251P \$10.25



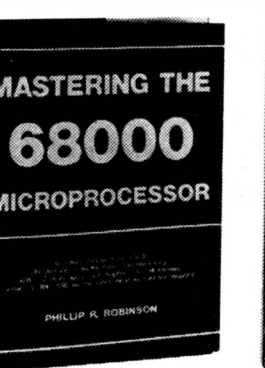
1997 \$21.95



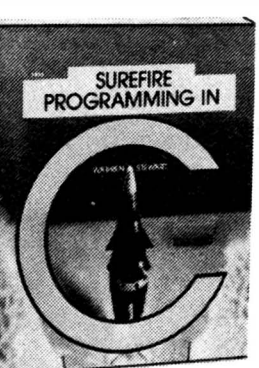
1737 \$18.95



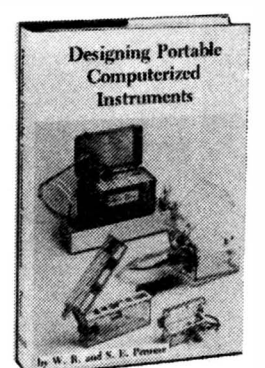
1275 \$15.95



1886 \$22.95



1873P \$16.95

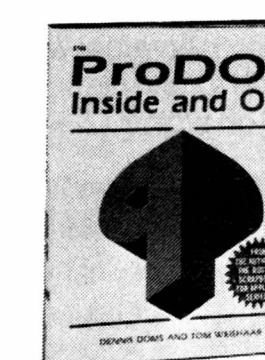


2710 \$27.95
Counts as 2

Membership Benefits • Big Savings. In addition to this introductory offer, you keep saving substantially with members' prices of up to 50% off the publishers' prices. • **Bonus Books.** Starting immediately, you will be eligible for our Bonus Book Plan, with savings of up to 80% off publishers' prices. • **Club News Bulletins.** 13 times per year you will receive the Book Club News, describing all the current selections—mains, alternates, extras—plus bonus offers and special sales, with hundreds of titles to choose from. • **Automatic Order.** If you want the Main Selection, do nothing and it will be sent to you automatically. If you prefer another selection, or no book at all, simply indicate your choice on the reply form provided. • **Ironclad No-Risk Guarantee.** If not satisfied with your books, return them within 10 days without obligation! • **Exceptional Quality.** All books are quality publishers' editions especially selected by our Editorial Board.



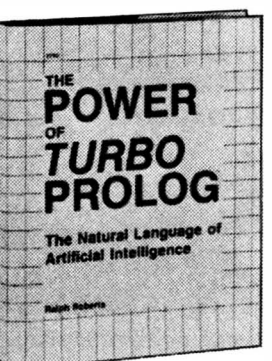
1884P \$18.95



2745 \$24.95



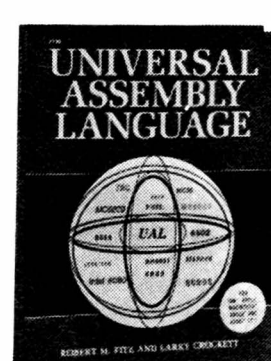
2831 \$22.95



2782 \$22.95



1990 \$24.95



2730 \$27.95
Counts as 2



The Computer Book Club®

P.O. Box 80, Blue Ridge Summit, PA 17214

Please accept my membership in The Computer Book Club® and send the 5 volumes circled below, billing me \$2.95 plus shipping and handling charges. If not satisfied, I may return the books within ten days without obligation and have my membership canceled. I agree to purchase at least 4 books at regular Club prices (plus shipping/handling) during the next 12 months, and may resign any time thereafter.

1085P 1251P 1275 1718P 1737 1768 1798 1807 1873P 1876P 1882 1884P 1886
1896 1898P 1969 1970 1976P 1990 1993 1997 2618P 2622 2623 2627 2640P
2650 2688 2691 2692 2710 2726 2729 2730 2732 2745 2748 2782 2831

Name _____

Address _____

City _____

State/Zip _____ Phone _____

Valid for new members only. Foreign applicants will receive special ordering instructions. Canada must remit in U.S. currency. This order subject to acceptance by The Computer Book Club® PC-387

PRODUCT LISTINGS

fers 128 fields per record, two billion records per file, and the capability to open up to 10 data base files simultaneously. DBman-Mac features 256 global memory variables, with unlimited local variables; pull-down menus that interface to standard Macintosh pull-down menus; a source-level debugger/editor with break point capabilities, error trapping, and validation of any data type (numeric, character, date, logic) entered from the keyboard. The program runs on the Mac Plus with one 800k disk drive and a minimum 512k of free RAM. *Versasoft Corp., 4340 Almaden Expressway, Suite 250, San Jose, CA 95118; (408) 723-9044; \$249.95 retail. (For additional product details, circle 239 on one of the Free Information Cards.)*

DBARCODE is a bar code printing program designed to print bar codes with descriptions, or multiple columns of bar codes across a page. According to the manufacturer, the package permits adjustment of bar and space widths to suit various bar code readers. It also provides for variable bar code height and vertical spacing. The memory requirement is 8k; an IBM Graphics-compatible printer is also required. *TimeKeeping Systems, Inc., 12434 Cedar Road, Cleveland, OH 44106; (216) 229-2579; \$99 retail. (For additional product details, circle 240 on one of the Free Information Cards.)*

DCOMM->LINK is a communications pro-

gram for dBase III Plus. The package is designed to expand the capabilities of dBase III Plus and other data base management programs such as Quicksilver, Foxbase Plus, and Clipper. According to the manufacturer, it enables external devices, remote systems, and outside dial-up computer services to exchange data directly to any data base that uses the Ashton-Tate standard for storage and management. Devices include bar code readers, cash registers, and computer service systems. The program enables any dBase system to accept incoming calls and handle data transfers automatically. The memory requirement is 512k. *FastComm Systems, Inc., 1704 22nd St., Santa Monica, CA 90405; (213) 828-9551; \$295 retail. (For additional product details, circle 241 on one of the Free Information Cards.)*

FAMILY ROOTS version 3, is a genealogical research program designed for use in large surname projects and family histories. Features of the new version include: nine user fields that can be added to the ones supplied for multiple marriages, children, and notes; text may be added with the user's word processor; searches may be made by name, alternate spellings, number, place, or any combination; users can add individuals to the data base in any order and the program will place them into family groups automatically. The memory requirement is 256k. *Quinsept, Inc., PO Box 216, Lexington, MA 02173*

(617) 641-2930; \$185 retail. (For additional product details, circle 242 on one of the Free Information Cards.)

FLOW CHARTING II+ is a flowcharting program with features including text fonts, line insert mode, and full DOS path support. Eight new text fonts have been added to the previous version of the program, for a total of 10 fonts, including high, wide, title, fat, Greek, and super/subscripts. The user can select free entry or auto-centering of the text from within the text mode. The line insert mode gives the F2 function key the ability to turn the cursor into a drawing tool that draws lines of four widths: normal, bold, hollow, and dashed. Users can design charts for the three standard paper sizes (8.5 by 11 inches, 8.5 by 14 inches, or 14 by 11 inches), and print sideways or normal, using draft or presentation quality print styles. With full DOS support, the computer will do the loading and printing. The memory requirement is 192k. *Patton & Patton Software Corp., 81 Great Oaks Blvd., San Jose, CA 95119; (408) 629-5376 or (408) 629-5044; \$229 retail or direct order. (For additional*

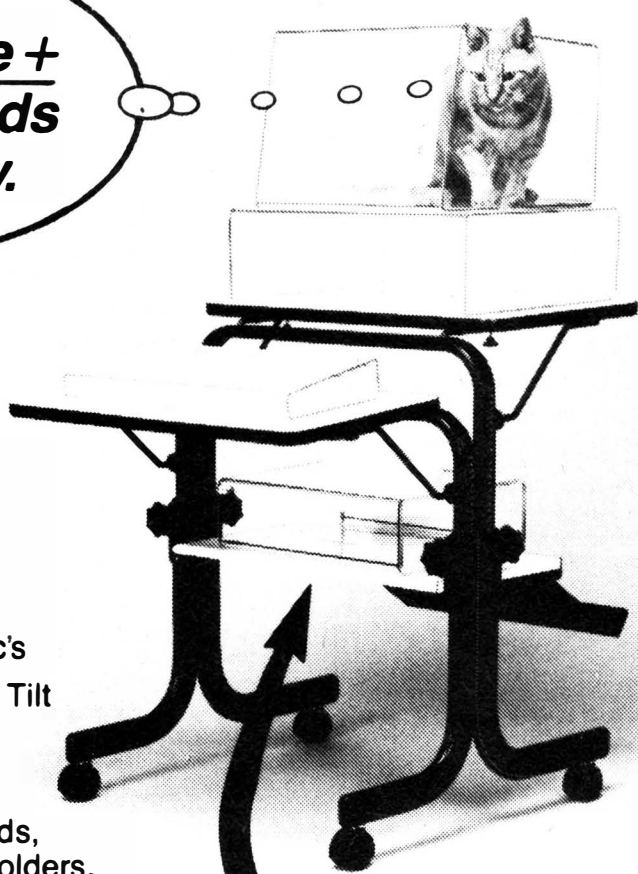
For more product information, please circle the appropriate number on one of the Free Information Cards that are located facing the Product Index within the product review section or opposite the Advertiser's Index.

The
ADJUSTable +
fits your needs
— perfectly.

**Compucat
Special
\$149**

plus UPS and options

- Fits PC/AT/Portables/Mac's
- Adjustable Height, Depth, Tilt
- Exceptional mobility w/optional Casters, \$19
- Also: Chairs, Printer Stands, CRT Swing Arms, Copy Holders, Cable Clips, Task Lights
- Special Package: \$269 for COMFORTchair & ADJUSTable
- Next Day Shipping with VISA/MC
- Thirty Day Money Back Guarantee



**NEW
OPTIONAL
PRINTER SHELF
\$49**

**ORDER
TOLL FREE 1-800-822-5301**

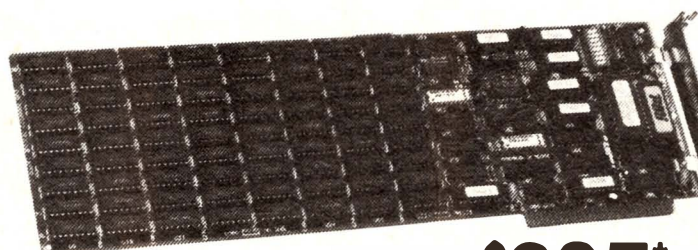
ACP
Adjustable Computer Products

In Texas, call collect. (713) 783-3881

6776 Southwest Freeway • Suite 150 • Houston, Texas • 77074

Volume discounts available. Dealer inquiries welcomed.

PMi FASTCARD
INTRODUCES
with 2 MBYTES



ONLY \$295*

10 DAY
FREE TRIAL
ONE
YEAR
WARRANTY

**The Only Expanded Memory Card
Which Can Save A Day Each Week.**

A major independent testing laboratory benchmarked a PC-XT equipped with FASTCARD and demonstrated a tenfold improvement over a PC-AT on typical Disk I/O operations.

- Portable between IBM PC, XT, AT and compatibles.
- Up to 2MB with Split Memory Mapping to
 - Fill memory to 640K
 - Provide Expanded memory over 640K
- Unique Disk Caching
 - Lotus/Intel/Microsoft compatible
- Ram Disks (up to 8MB)
- Custom Password Security
- Print Buffering
- Built-in Diagnosis and Automatic Fault Tolerance
- Factory Installed and Tested DRAM's

*Each FASTCARD III comes with 2 MBytes of Memory. FASTCARD IV, available with 2 MBytes, includes serial/parallel ports, game port and a clock/calendar for \$295. Dealer inquiries invited.

For additional information, contact **PMi** at

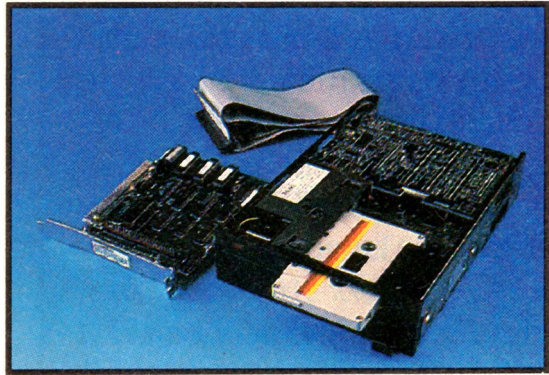
PERIPHERAL MARKETING INC. 602-483-7983
7825 E. EVANS RD., #500, SCOTTSDALE, AZ 85260

LOTUS EMS
COMPATIBLE

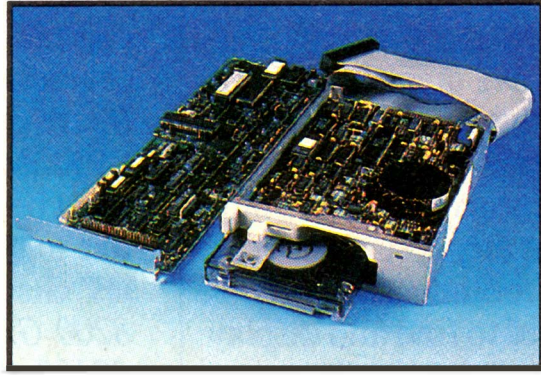
(For More Information Circle 200)

Mass Storage

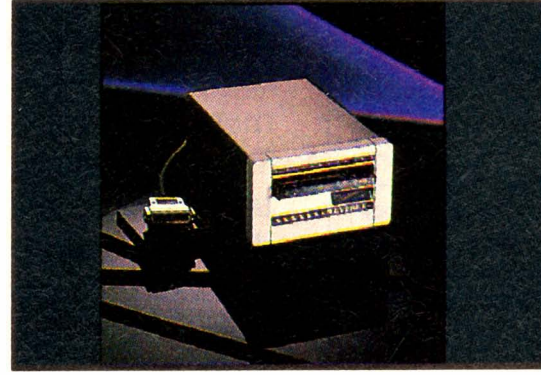
**IBM Computers, Tape Backup Systems, Add-On Boards
Hard Disk SubSystems, Modems & Much More.....**



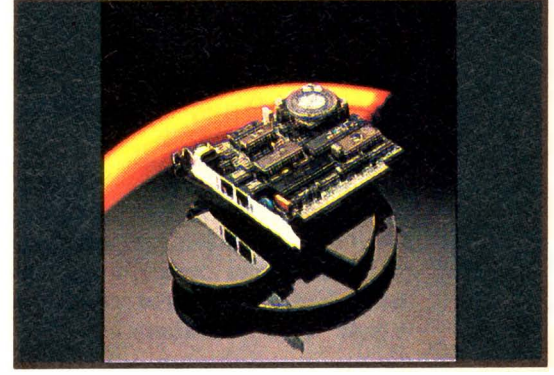
Everex Tape Backup
Excel Stream 20
Internal External
CALL \$625



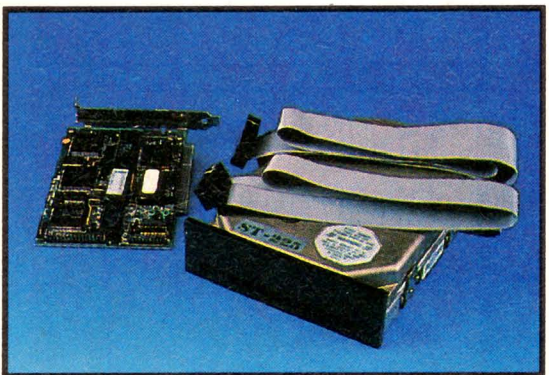
Everex Tape Backup
Excel Stream 60
Internal External
CALL \$850



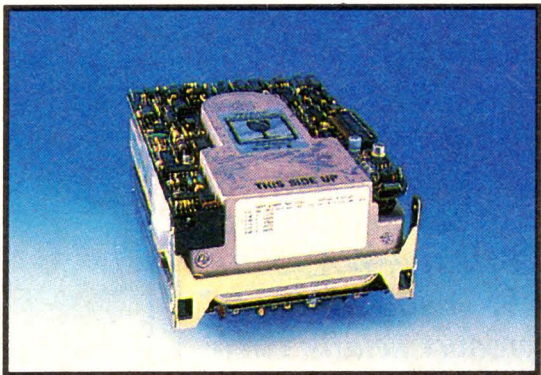
Everex Tape Backup
Excel Stream 60-8
External Only
\$695



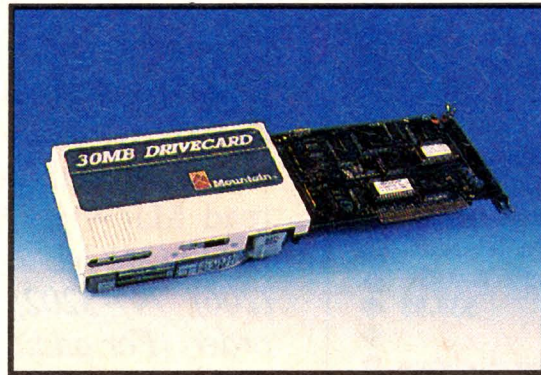
Everex Modem
Evercom II & III
1200 2400
CALL \$239



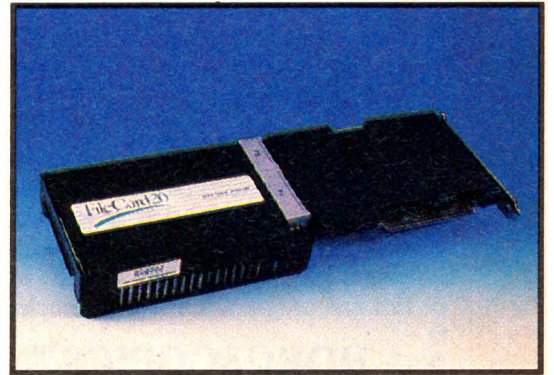
Seagate Hard Disks
Kits for PC & XT's
20MB 30MB
\$359 \$439



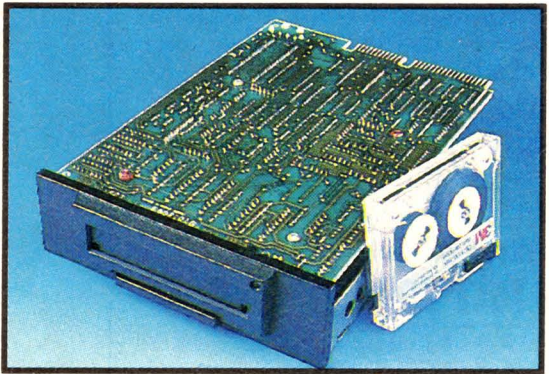
Seagate AT Drives
High Speed AT Kits
30MB 40MB
\$549 \$659



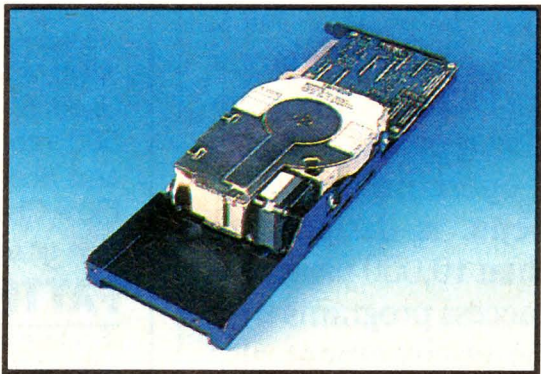
Mountain DriveCard
DriveCard 20 & 30
20MB 30MB
\$599 \$699



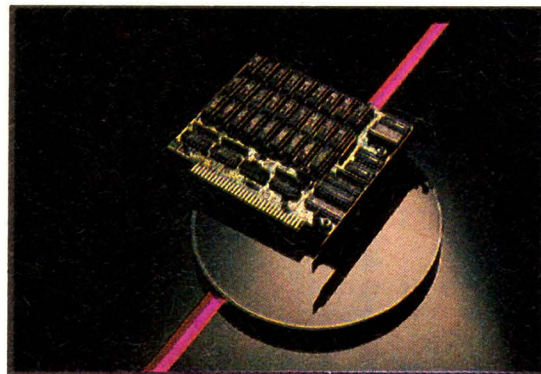
Western Digital Card
FileCard 20
20MB
\$529



Irwin Tape Backup
Internal Tape Backup
10MB 40MB
\$349 \$549



Tandon BusinessCard
BusinessCard 21
21MB
\$449



Everex Boards
Mini Magic Magic 16
W/384K Card
\$119 \$195



Everex (EGA)
EGA Boards
The Edge Enhancer
\$215 \$259

Plus Hardcard 20

Features:

Provides 21MB of storage on a card.
Takes up only 1 slot in your system.
Comes with a 1 year warranty.
Works in the IBM PC, XT, Compaq,
AT&T, Olivetti and most compatibles.
No Cables, No formatting, just plugs in.

**Special
\$659**

IBM PC, XT & AT'S

IBM PC 256K 1 Dr.....\$985
IBM PC 256K 2 Dr....\$1049
IBM XT 256K 1 Dr....\$1395
IBM XT 256K 2 Dr....\$1435
IBM XT 256K 20MB..\$1795
IBM AT 256K 1 Dr....\$2399
IBM AT Enhanced 30.\$4195
Everex Add-On Boards
Ram 3000.....\$175
Magic Card II.....\$130

Modems

U.S. Robotics 2400..\$365
Packard Bell 2400...\$279
Avatex 1200 (HC)...\$105

Monitors

NEC Multisync.....\$559
Taxan All Models...\$Call
Amdek All Models...\$Call

Storage Research Group
Tape Backup Cleaning Kit
\$29

TURBOTALK is a Trademark of Storage Research Group Corp.

All Products listed carry the standard factory warranty.

STORAGE RESEARCH GROUP

To Order Call 1-(312) 482-7437

Storage Research Group Corporation 428 S. Adams Hinsdale, IL. 60521

No surcharge for Mastercard, Visa, Discover, C.O.D. or Money Order. No sales tax on orders shipped outside IL. Amex has a 3% surcharge. Defective merchandise may be returned for repair or exchange only. We do not guarantee compatibility. Any goods returned for credit are subject to a 15% restocking charge.

ZEPHYR's

EXCLUSIVE SOFTWARE

Good Software! Great Prices!

For YOUR
APPLE II+ /IIe/IIc IBM PC/XT/JR
Pick the Ones YOU Want:

❑ **FINANCER™** —10 most needed financial calculations in easy to use package. Menu selectable for: amortization schedule, present values, future values, simple & compound interest, installment loan, days between dates, & more. Output to screen or printer. "FINANCER is best"—G.W., Montana **\$19.95**

❑ **MUSICMAN™** —Compose music on screen, placing notes, rests, sharps, flats on musical staff. Vary key, pitch, tempo & legato to perfect your music. Save your compositions to disk to replay or revise later. Comes with musical selections. 80 column display. **\$29.95**

❑ **ASTROSTELL™** —Learn the constellation using your computer, all 88 included. Four levels star brightness simulate sky on screen. Gives star names, positions of galaxies, nebula, etc., plus lore & observing tips. 80 column screen. "A Perfect Delight"—Prof. M.F., Minnesota. **\$29.95**

❑ **STATCALC™** —Key statistical functions for student or experienced user. Includes correlation & regression, normal, T, Poisson, binomial, Chi-square, distributions, data handling for sorts, mean, standard deviation, range, median. Save data to disk. Manual explains statistics and program use with examples. **\$39.95**

❑ **HOROSCOPICS™** —For your birthdate and time the exact sky conditions are calculated and horoscope chart printed out, with zodiac, sun, moon & all planets. Includes astrological reading, sun & moon sign, ascendant, conjunctions & oppositions. **\$24.95**

❑ **BIO-DATA™** —Calculates Biorhythms for any time period you specify and displays on screen or to printer. For your birthdate gives celestial longitude of sun and your astrological sign. Determines Julian Day #, days since birth & day of week for birth. **\$19.95**

❑ **VOCABULATOR™** —Improve your vocabulary at selectable skill level, from high school to sequepidalian. Use multiple choice or quick review mode. Add words you want included. "Recommended: Excellent Program"—Electronic Learning Mag **\$29.95**

❑ **SUPERCAT™** —Professional level cataloging for up to 5,000 books per directory with hard disk or 1000 per floppy (400 for Apple). Multiple subjects & authors, call #, title, publisher, etc., plus fields to customize. Print 3x5 index cards & reports in various formats. Sort and retrieve data by any field. Fast and easy to use. **\$49.95**

❑ **CATMAN™** —Catalog your books, records, tapes with ease. Store author, title, and subject for up to 3000 item per floppy (1500 for Apple). Use search options to get listings on screen or printer. Your choice if full power of Supercat not needed. **\$19.95**

❑ **HEADLINER™** —Print banners and signs on any 80 or 132 column printer in letters up to 13" high (smaller sizes, too). Any length headline. Great for parties, kids, offices, stores. Get your message across! On PC MAG Holiday '85 Wish List. **\$19.95**

FREE CATALOG OF OTHER SOFTWARE
CALL OR WRITE

ORDER TODAY!

By phone or mail. Check, M.O., credit card (# & Expir. Date). Add \$2 shipping (\$4 overseas). PA add 6%. Give COMPUTER TYPE. JOIN OUR THOUSANDS OF SATISFIED CUSTOMERS in 50 states and more than 60 countries, including homes, businesses, schools, & governments. Fast shipment!

ZEPHYR SERVICES



306 S. Homewood Dept. C
Pittsburgh PA 15208
412-247-5915



ORDER BY PHONE 9-9, MON-SAT
OUR 5th YEAR OF BUSINESS

(For More Information Circle 162)

PRODUCT LISTINGS

product details, circle 243 on one of the Free Information Cards.)

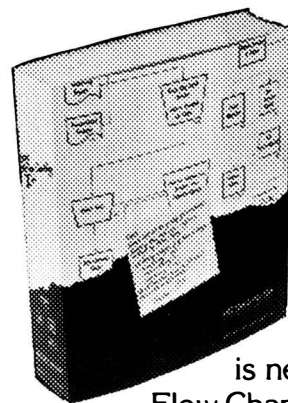
GUIDE, for the Macintosh, is a personal hypertext system designed to incorporate many of the features of word processors and outline processors as well as additional abilities for information management, such as cross-referencing and annotation. According to the manufacturer, the program enables the user to create live areas in a document that can be activated by a mouse. When clicked on, these live areas can open up new areas of the document that were hidden. They can also open up pop-up windows for notes, comments, footnotes, or definitions, or they can be used to find and display cross-referenced information in the same document or in another document. Guide also works with text and graphics, giving it desktop publishing capabilities. The program requires a 512k Macintosh, a Mac Plus, or a Macintosh XL. It can work with any graphics program that supports the Clipboard, and has an option to save files in MacWrite format so that it can be used with MacWrite, Microsoft Word, Aldus' PageMaker, or with any other program that can read MacWrite files. *OWL International, Inc., 14218 NE 21st St., Bellevue, WA 98007; (206) 747-3202; \$134.95 retail or direct order. (For additional product details, circle 244 on one of the Free Information Cards.)*

HOMEBASE version 2.5 is a report writer that includes a feature designed to produce reports that the manufacturer says are nearly identical to the reports generated by Traveling SideKick. A utility is included that converts SideKick files to HomeBase files. Newly added features include larger memory-resident files, a DOS operating environment, and expanded report writing capabilities. The DOS operating environment, called PowerMenu, is designed to enable access to more than 10,000 programs through menus, which access programs with a single keystroke. The environment also features a File Manager that displays directories and files, and provides direct menu-driven access to DOS commands. The memory requirement is 80k. *Brown Bag Software, The Software Resource Group, Inc., 2105 South Bascom Ave., Campbell, CA 95008; (408) 559-4545; \$89.95 retail. (For additional product details, circle 245 on one of the Free Information Cards.)*

INTERWORD is a multilingual word processing package designed to provide simplified production of multilingual documents. Features of the program include: switching between languages with one keystroke without changing disks; enhancement of documents with straight-line graphs; editing and printing text in 11 languages (Danish, English, French, Finnish, German, Icelandic, Italian, Norwegian, Portuguese, Spanish, and Swedish); writing/editing and printing of any combination of Italian, English, French, German, and Spanish; inserting words and letters of one language into another; cut-and-paste functions that define text for repositioning in a document segment or file; formatting text in multiple vertically justified or ragged-right columns or dividing it

horizontally in a desired screen width; creating simple and shaded bar charts and line graphs, horizontal and vertical rules and dividers, linear frames, and outlines for columns, sections, and blocks of copy; and creating organizational tables based on lines and rectangles. The memory requirement is 128k; also required is a color or monochrome monitor driven by a board having a character generator compatible with one of Interword's character generators. An EPROM computer chip that is provided must be installed on the IBM PC or compatible to use with specific language and graphics characters. *Computers Anyware, Inc., 8200 Greensboro Drive, #304, McLean, VA 22102; (703) 442-7910; \$495 retail. (For additional product details, circle 246 on one of the Free Information Cards.)*

MATH RABBIT, the school edition, is designed specifically for classroom use and includes a teacher's guide with lesson plans, blackline masters for student activities, a scope and



Flow Charting II+ The New Plus for Fast Flowcharting

FLOW CHARTING
is new! It's now

Flow Charting II+, with more speed + more functions + more printing options;
• 10 text fonts; 26 shapes; • Line mode can stop at a shape; • Backspace key can erase a line to its origin; • Free text entry anywhere, or select auto-centering; • Vertical or horizontal printing; one chart or multiple charts.

Used by Fairchild, Bechtel and more than 500 other major corporations. Edit quickly and accurately — even major edits — with Flow Charting II+, the Specialist.

See your retail store or call:

PATTON & PATTON

Software Corporation
800/672-3470, ext. 897 California
800/538-8157, ext. 897 National
408/629-5044 International)

(For More Information Circle 203)



Apparat, Inc. VOLUME BUYER
PRICE LIST

LIFETIME WARRANTY
ON APPARAT MANUFACTURED
PC/XT/AT BOARDS - MIX OR MATCH
TO ACHIEVE VOLUME DISCOUNT

Part No.	Description	QTY 10+
7600	Clock/Calendar	\$39.00
7602(6)	Eprom Programmer (24 or 28 Pin)	\$77.00 ea.
7609	5 Function Combo II	\$89.00
7624	64/384K Multifunction	\$137.00
7630	64K/2M EMS RAM/Clock	\$129.00
7670	256K/1.28M EMS RAM Multifunction	\$179.00
7640	64/256K RAM	\$53.00
7650	64/512K RAM	\$77.00
7664	64/384K RAM/Clock	\$89.00
7852	128K/3 MEG AT Combo	\$179.00
7860	0 K Piggyback Card (1.5MB) For 7852	\$65.00
7870	128K/2MB AT RAM Only	\$131.00
7950	Short Slot Parallel/Serial	\$59.00

C.O.D. CASH OR CASHIER'S CHECK UNLESS
PREVIOUSLY APPROVED COMPANY CHECK
303-779-0819

ORDER LINE 800-525-7674

APPARAT

6801 S. DAYTON ENGLEWOOD, CO 80112

(Circle 202)

PERSONAL COMPUTING / MARCH 1987

sequence chart, and program and backup disks. The program is designed to introduce children in grades kindergarten through two to early math concepts: addition, subtraction, recognizing number relationships and patterns, and skills for future work in multiplication. The memory requirement is 256k. *The Learning Company, 545 Middlefield Road, Suite 170, Menlo Park, CA 94025; (415) 328-5410; \$39.95 retail. (For additional product details, circle 247 on one of the Free Information Cards.)*

MINDWRITE, for the Macintosh, is a word processor with an integrated outliner. The program is designed so that the user can turn outlining features on and off in any document, in any window or paragraph. Features of the program include: multiple selection of text segments; multiple windows; auto-numbering, automatic labeling; multilevel rulers to eliminate formatting steps; comprehensive searches through all or selected text; automatic time and date stamps; comprehensive preferences for specifying font, formatting, and viewing characteristics for new documents; and the ability to drag text. The package requires a 512k Macintosh and external disk drive. *MindWork Software, PO Box 222280, Carmel, CA 93922; (408) 625-2720; \$125 retail. (For additional product details, circle 248 on one of the Free Information Cards.)*

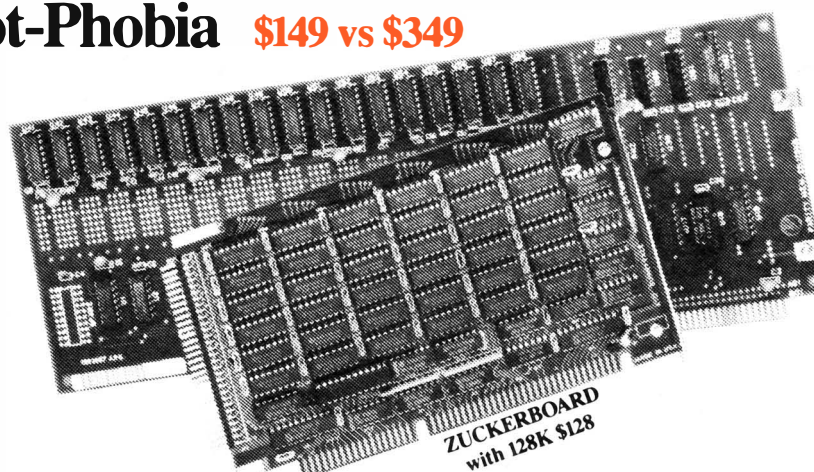
MVP SPREADSHEET PLUS is a spreadsheet featuring a backward solving capability. According to the manufacturer, MVP users are able to change the output values or calculated cells of a spreadsheet and work backward to see how variables would have to change to produce the desired result. This enables the user to perform what-if budget analysis. Other features of the program include: the ability to respond to English commands; an UNDO command; an integrated macro writing and editing tool; and the ability to have more than 30 categories of information on one spreadsheet at one time. The memory requirement is 640k, and a 1.5Mb hard disk is also required. *Bell Atlantic Corp., Network Services, Inc., 1310 N. Court House Road, Arlington, VA 22201; (703) 974-3000; \$400 retail. (For additional product details, circle 249 on one of the Free Information Cards.)*

THE OPEN ACCESS II DATABASE, with programming language, is a relational data base designed to give users unlimited file, screen, and reporting formats. According to the manufacturer, it can access and join eight files simultaneously; enabling file updates, calculation, input verification, and comparisons. The memory requirement is 256k. *Software Products International, 10240 Sorrento Valley Road, San Diego, CA 92121; (619) 450-1526; \$395 retail. (For additional product details, circle 250 on one of the Free Information Cards.)*

THE OPEN ACCESS II SPREADSHEET, with 3D

For more product information, please circle the appropriate number on one of the Free Information Cards that are located facing the Product Index within the product review section or opposite the Advertiser's Index.

Fit Twice as Many Boards
in the Same Amount of Space... For a Lot Less
**Introducing "The First Cure" for
Slot-Phobia \$149 vs \$349**



Both bring the IBM AT, 286 XT
and compatibles to a full 640K... But
ZUCKERBOARD Gives You More...

- MORE:** 0.5 megabytes of extended memory or a full 1.0 megabytes of extended memory.
- MORE:** Z BUS to plug in a secondary memory board for a total of 2.0, 3.0, 5.0 or 9.0 megabytes in only one expansion slot.
- MORE:** Obsolescence Proof. Trade in secondary memory boards for a greater density expansion memory board.
- MORE:** 2 year warranty and made in the USA



Dr. Dr. Zucker

**It's another
ZUCKERBOARD**

QTD 235 Santa Ana Court • Sunnyvale, CA 94086
(408) 720-1942 • 1-800-458-6200 CA • 1-800-624-4920 US

It's another ZUCKERBOARD is a registered trademark of Advanced Transducer Devices Inc. — © 1986 Advanced Transducer Devices — IBM is a registered trademark of International Business Machines Inc.
All prices subject to change without notice due to fluctuations in the chip market.

(For More Information Circle 174)

AccountMateTM

Integrated Accounting Software Recommended for Professionals, by Professionals!

"one of the best dBase accounting packages available."

"The program is so well organized and well designed that it is almost possible to run the system without documentation."

Data Based Advisor

"The General Ledger system may be the best choice for the knowledgeable user, since it has much more power than other bookkeeping software systems."

Business Software

"This is a very powerful program. I was impressed by the ease of set up and the on-screen help file."

PCM Magazine

800-228-8896

Nationwide

800-762-7788

California

800-361-4778

Canada

**Free Source Code provided.
Demo Programs \$25. Each**

Integrated Accounting Modules	Single-user	Multi-User
General Ledger	395	595
Consolidated Ledger	195	395
Sales Order/Inventory	195	395
Purchase Order/Inventory	195	395
Accounts Receivable/Inventory	295	495
Accounts Payable	295	495
Payroll	395	595
State Tax Program	100	200
Time & Billing	395	595
Fund Accounting	395	595
Manufacturing Inventory Control	995	1,195
Working Demo	25	—
TelemarketMate	495	—
SearchMate	199	199

Prices, U.S. Currency Only.

Multi-User Now Available!

Easy, fast and flexible
dBASE III, multi-user
dBASE III plus and
Clipper-compiled
dBASE III versions
available.

SourceMateTM

INFORMATION SYSTEMS, INC.

For the dealer nearest you call (415) 381-1011.
20 Sunnyside Ave., Mill Valley, CA 94941

Canadian Distributor:

Synapse Datagroup, Inc.

Montreal: (514) 383-1515

Toronto: (416) 299-0838

Winnipeg: (204) 942-7449

dBASE III and dBASE III Plus are registered trademarks of Ashton-Tate, Inc. UNIX is a registered trademark of AT&T. Data Based Advisor is a trademark of Data Based Solutions. AccountMate, AccountMate II, AccountMate III Plus are trademarks of SourceMate Information Systems, Inc. Clipper is a trademark of Nantucket.

(For More Information Circle 161)

PRODUCT LISTINGS

graphics, includes a goal-seeking feature. This feature is designed to free the user from doing what-if analyses. With Open Access, the user needs to establish one or more goals—the spreadsheet will then calculate the values needed to achieve the goals. The graphics included in the spreadsheet include 3D surface plots, scatter plots, financial high-low-close graphs, stacked line and bar graphs, and overlays. The on-screen graphics editing includes rotation. The memory requirement is 256k. *Software Products International, 10240 Sorrento Valley Road, San Diego, CA 92121; (619) 450-1526; \$295 retail. (For additional product details, circle 310 on one of the Free Information Cards.)*

PC MANAGER is a RAM-resident program with a Remind feature that initiates feedback on managerial performance and reminds the user of appointments, goals, and things to do while another program is running. The manufacturer says that in addition to a reminder appearing 15 minutes prior to appointments, random motivational messages track the user's managerial performance. Features of the program include: a Calendar screen that is arranged daily and monthly to trigger reminders; a Goal screen that defines goals; an Information/People screen that stores personal information; an Action/People screen that tracks productivity; a Notes screen that is an easy-to-use memo pad; a Feedback screen that compiles

weekly and monthly statistics on the number of items accomplished; and a calculator, calendar, and time tool available from any screen to assist in daily activities. The memory requirement is 192k. *Sterling Castle Software, 702 Washington St., Suite 174, Marina del Rey, CA 90292; (213) 306-3020 or (800) 722-7853; \$99 retail. (For additional product details, circle 311 on one of the Free Information Cards.)*

PC TRACKER version 4.0, an integrated management system, is designed to keep inventory for tracking personal computers, software, peripherals, and accessories through a data base that includes users, vendors, products, and inventory. The package enables managers to keep track of equipment and users. Features of the program include built-in reports in summary or detail form, ad hoc reports that use the query-by-example technique, and full export/import facilities. The memory requirement is 256k. *RG Software Systems, Inc., PO Box 426, Fort Washington, PA 19034; (215) 576-0970; \$495 retail. (For additional product details, circle 312 on one of the Free Information Cards.)*

PRISM, a risk analysis and simulation modeling program, is designed to use probabilities and simulation techniques to enable the modeling of uncertain or risky situations. According to the manufacturer, Prism enables users to develop, analyze, and maintain their own risk analysis models and generate

probability distributions of the possible outcomes that may be encountered. Models may include hundreds of equations and complex relationships. A single simulation can generate hundreds of output distributions. A wide variety of distribution types are available for entering data. The memory requirement is 512k, and a graphics adapter is also required. *Tempus Development Corp., 1941 N. Vermont St., Arlington, VA 22207; (703) 522-3780; \$895 retail. (For additional product details, circle 313 on one of the Free Information Cards.)*

READER-PC is a proofreading program that checks a document for duplicated words, missing capitalization, and misspelled words. The program checks the spelling of words in the document by matching them to words in the 39,000-word dictionary that is part of the system. The user can customize the system to include multiple auxiliary dictionaries that are specific to special subject areas, departments, or groups. The memory requirement is 128k. *Legist Automation, Inc., 2405 Garden Park Court, Suite C, Arlington, TX 76013; (817) 274-0089; \$189 retail. (For additional product details, circle 314 on one of the Free Information Cards.)*

REAL ESTATE INVESTMENT TEMPLATES are a series of worksheet templates for Lotus 1-2-3, VP Planner, or other spreadsheets capable of using 1-2-3 worksheet files. The series is designed to include a 10-year sensitivity

 ZIMCO 	
INTERNATIONAL, INC.	
85-39 213 St., Queens Village, NY 11427	
▶▶▶ FOR IBM ◀◀◀	
FOUNTAIN AT 640k & 1.2meg floppy	\$1275
TOSHIBA 1100 +	\$1800
256K, 150ns chips	\$2.60
MICROSOFT MOUSE w/paintbrush, bus/serial	\$114 / \$130
WATSON*Brains for your telephone	\$319; VIS Sftwr. + \$200
Ariel/XCELX 6-12 MHz for AT's	\$112; Op. Sftwr. + \$25
COMPUSERVE KIT includes \$25 of time	\$25
CRUISE CONTROL time/date stamps, screen blanks tool	\$23
FASTBACK v5.10 The best backup. Not protected	\$93
NORTON UTILITIES Invaluable help!	\$50
SMARTNOTES "Post It" on screen	\$45
SARGON III - World's hottest chess master	\$33
Q & A v2.0 The Intelligent Database	\$219
INTEL ABOVEBOARD w/128k	\$344
AST SixPack Plus/ 512k Premium	\$150/\$369
HERCULES Mono Graphics/Color	\$179/140
PARADISE Autoswitch EGA	\$352
STB EGA Plus	\$280
▶▶▶ FOR APPLE ◀◀◀	
RAMWORKS III 512/1Meg	\$195/\$269
A + Mouse (IIC, Mac)	\$76
80 Col. II + /Ext. 80 col. Card	\$59
▶▶▶ MONITORS ◀◀◀	
NEC MULTISYNC \$577w/NEC GB-1 PGA-graphics bd.	\$958
AMDEK 600/722 Color	\$399/470
NAP Monochrome	\$89
PRINCETON HX-12 RGB	\$399
▶▶▶ MODEMS ◀◀◀	
HAYES Smartmodem 1200/2400	\$359/559
PROMETHEUS PROMODEM	\$260
1200 Internal/External Hayes Comp	\$149/\$169
U.S. Robotics Courier 2400	\$399
▶▶▶ DRIVES ◀◀◀	
20 Meg HardDrive w/controller, rails	\$349
20 Meg. CardDrive (IBM)	\$399
Disk Drive (Apple)	\$99
▶▶▶ PRINTERS ◀◀◀	
CITIZEN 120D/MSP-10	\$190/298
EPSON FX-85/F-286/LX-86	\$359/499/\$249
Epson EX-800/LQ1000	\$489/729
OKIDATA 192/193	\$355/455
PANASONIC KXP-1092	\$330
STAR NX-10/SR-15	\$239/545

**FREE SHIPPING
ON PREPAID ORDERS
CALL TOLL FREE
1-800-227-6647
INQUIRIES & NYS CALL
1-718-479-7888**

*You CAN count
your nest egg before it's
hatched!*

Preview the new tax impact on:

Buying/selling securities Adjustments in
family income Real estate transactions
Any major financial decision

At the non-taxing price
of only
39.95

Tax planning software for IBM
and compatibles, will lead
you step-by-step through
any variety of financial/tax-
impacting scenarios. All
ramifications of New Tax

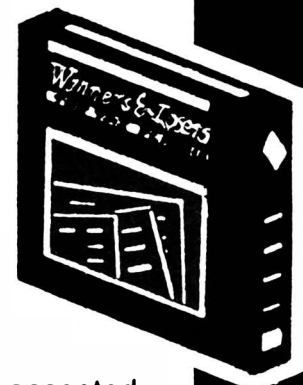
Reform Bill included. And projec-
tions are possible for years to come. Great for
individuals and tax professionals.
Requires only 256K RAM.

Winners & Losers
THE TAX PLANNER

CALL 1-800-367-3058
415-668-1299 (CA)

Send \$39.95 + \$3.00 handling/postage
Check/Money Order/VISA/MasterCard accepted.

Winners & Losers: The Tax Planner
3145 Geary Blvd., Suite 407, San Francisco, CA 94118
UNCONDITIONAL GUARANTEE!
If not 100% satisfied, return within 30 days for full refund.



analysis and cash-flow projections for income property, leasing analysis, internal rate of return, loan amortization, wrap-around mortgage analysis, and an annual property operating statement. There are seven worksheet templates included in the package: Income Property Analysis; Leasing Analysis; Summary, for an annual property operating statement; IRR, to calculate Internal Rate of Return; Amort, for a complete amortization schedule; AmortSum, for an amortization summary; and Wrap, to evaluate the profitability of a wraparound mortgage. The memory requirement is 256k, Lotus 1-2-3 version 1A or later is also required. *RealTech Systems, Inc., 406 South Bascom Ave., Suite 223, San Jose, CA 95128; (408) 294-4420; \$189 direct order. (For additional product details, circle 315 on one of the Free Information Cards.)*

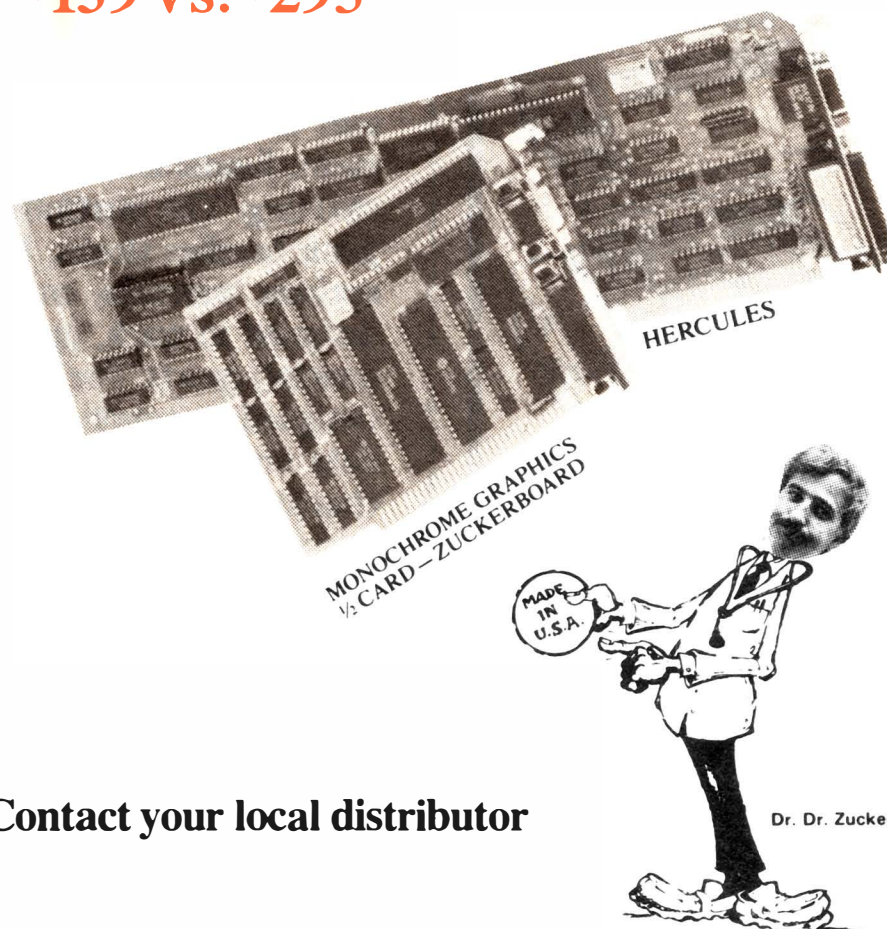
SPELLSWELL, version 1.3, the spell checking and proofreading program for the Macintosh, now scans documents created with Microsoft Works, Lotus' Jazz, and Living Videotext's More. Spellswell can also scan documents created with Apple's MacWrite, Microsoft Word, and Living Videotext's ThinkTank, as well as any text-only document. The new version includes a 93,000-word dictionary, and features expanded proofreading capabilities, enhanced speed, and keyboard shortcut option settings. The memory requirement is 368k. *Green, Johnson, Inc., 15 Via Chualar, Monterey, CA 93940; (408) 375-2828; \$74.95 retail or direct order. (For additional product details, circle 316 on one of the Free Information Cards.)*

PERFORMANCE

ACCOUNTANT'S CHOICE, a business accounting package for the Macintosh, includes System Manager, General Ledger, and Accounts Payable modules. The System Manager is a data base system that is designed to function as a report generator, a mass change editor, and a file builder so users can create custom data files. The General Ledger features a chart of accounts, financial statement formats, an unlimited number of accounts and budgets, financial statement printing, and prior postings to past months. Features of Accounts Payable include control over aging periods, debit memo processing, and check maintenance. All forms, such as checks, invoices, etc., are customized so they can be printed in any format. All the modules run under the System Manager, so it is possible to bring up more than one function at a time. The System Manager must be installed to run any of the program's modules. The memory requirement for each module is 512k; a hard disk is recommended. *Enchanted Software, Inc., PO Box 21507, Albuquerque, NM 87154; (800) 654-6795; \$99 (each module) direct order. (For additional product details, circle 319 on one of the Free Information Cards.)*

THE ACTIVE INVESTOR, an investment system, accesses a Wall Street financial data base maintained by the Interactive Data Corp. (IDC). According to the manufacturer, in

½ Size, ½ Cost & Not A Clone!
Monochrome Graphics ½ Card —
\$139 vs. \$295*



Contact your local distributor

It's another
ZUCKERBOARD

QTD 235 Santa Ana Court • Sunnyvale, CA 94086
(408) 720-1942 • 1-800-458-6200 CA • 1-800-624-4920 US

Hercules is a trademark of Hercules Computer Technology, Inc.

*Average price of 400 dealers according to June 1986, survey by Store Board Inc., Dallas, Texas

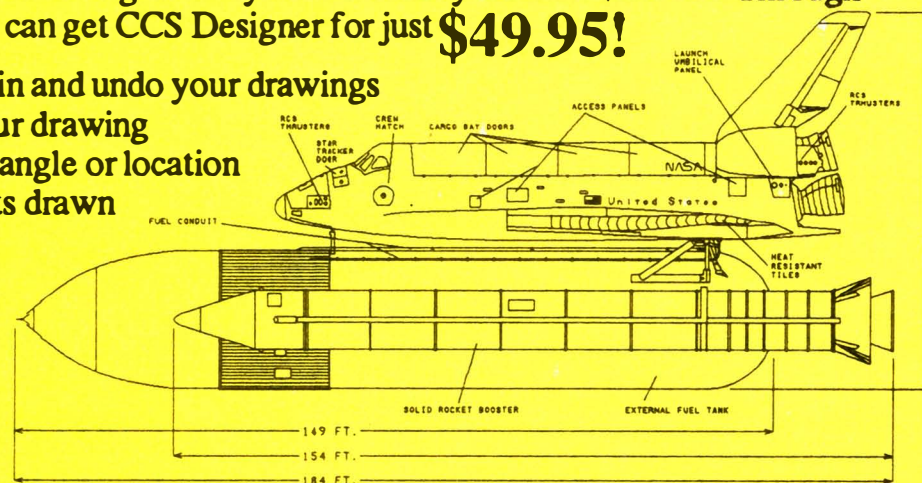
ZUCKERBOARD is a registered trademark of Advanced Transducer Devices, Inc.

(For More Information Circle 175)

CCS DESIGNER™ Professional-quality CAD made affordable

A powerful Computer Aided Design program that compares to CAD systems costing thousands of dollars! CCS Designer is easy to learn and use, allowing virtually anybody to make detailed, professional-quality drawings. This outstanding CAD system normally sells for \$139.95. Through this **Special Limited-Time Offer**, you can get CCS Designer for just **\$49.95!**

- Enlarge, rotate, copy, paint, zoom-in and undo your drawings
- Change the angle of any part of your drawing
- Retrieve your symbols at any size, angle or location
- Choose from multiple character sets drawn with vectors and curves
- Mouse supported but not required
- 16 color high-resolution output
- Auto-dimensioning and scaling
- Supports 82 dot-matrix printers, 17 input devices and 59 plotters



- Supports IBM® CGA, EGA, AT&T™, Hercules™, Persys™, Tandy™, Techmar™ and 3270 display cards. IBM-PC/XT/AT or compatible, 512K, DOS 2.0 or later & graphics display adapter. 2 drives recommended.

LOGIMOUSE C7®

LogiMouse C7 is an ultra-responsive, high-resolution, opto-mechanical mouse that usually sells for \$119.95. Through this Special Offer you can get LogiMouse C7 for just **\$89.95!**

- High Resolution: 200 dots per inch for precise control: That's TWICE as accurate as most mice!
- High Baud Rate: Programmable to 9600 baud.
- Mechanical: Requires no special grids or pads.
- No External Power Supply Required: LogiMouse plugs directly into the serial port.
- Low Power Consumption: Almost runs on thin air!
- Software Bonus: Comes with software that allows you to customize any program to use the mouse!!!

EXTRA SAVINGS

CCS Designer & LogiMouse only \$129.95!

PC Paintbrush® 3.0, the best selling paint program for the PC is now just \$39.95! Order with LogiMouse and get both for \$119.95!

BEST BUY: Get all three: CCS Designer, LogiMouse & PC Paintbrush for only \$149.95!

Offer Good Only While Supplies Last!!

Order
NOW



Send your check or money order and your request to CCS or give us a call.

Include \$3.75 for shipping and handling. CA res add sales tax. LogiMouse is a registered trademark of Logitech. PC Paintbrush is a registered trademark of Z-Soft Corporation.

Complete Computer Services, Inc.

819 Mitten Road • Suite 21
Burlingame, California 94010
(415) 692-7250

(For More Information Circle 192)

PCCB Has Super Values

Overnight Delivery Available. Call In Your Toll FREE Order Today 1-800-245-4122

LX-86

List \$349⁰⁰

\$229⁹⁵

FX-85

List \$599⁰⁰

\$339⁹⁵

FX-86 E

CALL

FX-286

List \$799⁰⁰

\$499⁹⁵

FX-286 E

\$549⁹⁵

Call PCCB For SUPER VALUES

EX-800

List \$799⁰⁰

\$459⁹⁵

EX-1000

List \$995⁰⁰

\$599⁹⁵

Call In Your Toll Free Order Today 1-800-245-4122

CR420i

\$679⁹⁵

LQ-800

List \$799⁰⁰

\$499⁹⁵

LQ-1000

List \$1095⁰⁰

\$699⁹⁵

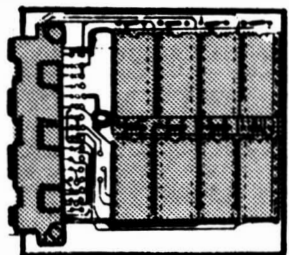
LQ-2500

List \$1595⁰⁰

\$1049⁹⁵

Call PCCB For Super Values

The Most ESSENTIAL CARD For The EQUITY I



- Able To Bring The Mother Board to 512K
- 1/2 The Size of Other Cards
- 3 Year Warranty
- Save Up to \$70.00

\$99⁹⁵



Call PCCB Today

Prices Subject to Change Without Notice

Add 2.9% for use of Visa, M/C, Choice & Discover. Add 5% for use of American Express. Restocking fee: 20% of mdse. cost.

These Prices Are Good For Mail Order Dept. Only

P.C. Computer Brokers Inc.
3879 East 120th Ave.
Thornton, CO 80233
(303)450-6727

1-800-245-4122

(For More Information Circle 178)

PRODUCT LISTINGS

addition to IDC the user can get data directly from Value Line Investment Survey, which analyzes and rates more than 1,600 stocks and 92 industries. The system consists of three programs: portfolio management, fundamental analysis, and technical charting. The portfolio management program handles stocks, bonds, commodities, options, warrants, and mutual funds. It is designed to track, update, and generate financial reports. The fundamental analysis is designed to supply key items of financial data on a public company. The technical charting program offers 30 charting methods; it is designed to enable the user to pre-program specialized charting methods. The memory requirement is 256k. *The Jeffers Corp., 2570 San Ramon Valley Blvd., Suite A103, San Ramon, CA 94583; (800) 356-1122 or (800) 452-1122 (in Calif.); \$395 retail. (For additional product details, circle 320 on one of the Free Information Cards.)*

ALS 18C FINANCIAL CONSULTANT is a menu-driven financial calculator. The program calculates loan amortization, savings and annuities, metric conversion, percent calculations, break-even analysis, depreciation, internal rate of return, IRAs, discounted cash flow, investment analysis, buying vs. leasing, simple interest, statistics, leasing, real estate, and bonds. ALS 18C can run as a RAM-resident pop-up. It also includes a scientific calculator. The memory requirement is 50k. *Cloneware, Advanced Logic Systems, Inc., 1283 Reamwood Ave., Sunnyvale, CA 94089; (408) 747-1988; \$89.99 retail. (For additional product details, circle 321 on one of the Free Information Cards.)*

THE ENHANCED-SPEED AUTOSKETCH, a computer-aided design (CAD) package, has now been enhanced to work with an 8087 or an 80287 math coprocessor. Because the enhanced-speed version is a smaller program than the standard version, it provides more available memory, enabling more complex or larger drawings. The memory requirement is 512k. *Autodesk, Inc., 2320 Marinship Way, Sausalito, CA 94965; (415) 331-0356; \$99.95 retail or direct order. (For additional product details, circle 322 on one of the Free Information Cards.)*

CAPTAIN'S LOG is a program designed to train the user in cognitive skills including attention, concentration, memory, visual/motor, and reasoning. Features of the program include "game-like" skill training, color graphics, three levels of play, an assessment mode and response score printouts, mouse menu and game control, and automatic dating and timing of sessions. The memory required is 128k; a Microsoft-compatible mouse, a hard disk, and a color monitor are also required. *Network Services, 1915 Huguenot Road, Richmond, VA 23235; (804) 379-2253; \$895 direct order. (For additional product details, circle 324 on one of the Free Information Cards.)*

DESKTALK is a menu-driven desk organizer and communications program with a RAM-resident calendar for daily, weekly, and monthly planning. Also included in the program is a memory-resident card file that is designed to enable the user to sort, cross-

index, and print information; and a phone dialer that automatically dials phone numbers and long-distance prefixes. The manufacturer says the 100 percent Hayes-compatible communications program that is included in Desktalk enables the user to send and receive information, automatically answer and dial the phone, and automatically send log-on strings. This part of the program is non-resident. The memory requirement is 70k; a Hayes or compatible modem is also required for the phone dialer and communications program. *Cloneware, Advanced Logic Systems, Inc., 1283 Reamwood Ave., Sunnyvale, CA 94089; (408) 747-1988; \$59.95 retail. (For additional product details, circle 325 on one of the Free Information Cards.)*

DISK EXPLORER is a file recovery system for accidentally erased or deleted files. According to the manufacturer, DOS directories may be displayed, and the status of files can be changed to prevent accidental erasure of a file or data being changed in any sector of the disk. Defective disks can be formatted so that DOS will not detect bad sectors. The memory requirement is 128k. *Quaid Software Limited, 45 Charles St. East, Third Floor, Toronto, Ontario, Canada, M4Y 1S2; (416) 961-8243; \$US75 (\$C105) retail. (For additional product details, circle 326 on one of the Free Information Cards.)*

FILENOTES is a memory-resident program that enables users to catalog and describe files, and recall file names as needed by scanning an on-screen index card directory. After the program is loaded into memory, it can be popped-up onto the screen. The memory requirement is 256k. *Practical Peripherals, 31245 La Baya Drive, Westlake Village, CA 91362; (818) 991-8200; \$39.95 retail or direct order. (For additional product details, circle 327 on one of the Free Information Cards.)*

INTERMAIL, for the Macintosh, is an electronic mail system designed to enable both local and remote networks to communicate and transfer files. Features of the program include multitasking server operation, multiple message type (including the Network Assistance Message), multiple zone support, comprehensive file transfer capabilities, on-line help, custom mailing lists, a receipt of message indicator, and mailbox password security. The program, which operates as a desk accessory, is available from within any application running at the time (provided that the program has been installed in the System file). In addition, users can read, print, or delete multiple messages at once. InterMail is designed to enable the user to send either standard, telephone, or network messages of up to 32,000 characters each. According to the manufacturer, the program notifies the user of the arrival of a new message in one of three ways: an alert box that displays the sender's name and message title; an icon flashing in the menu bar; or telephone-like rings. The program requires a minimum 512k of RAM and an AppleTalk or compatible network. *Interactive Network Technologies, Inc. (Internet), 20 Amy Circle, Waban, MA 02168; (617) 965-5239; InterMail is site licensed, and pricing is de-*

terminated by the number of network users: 1-4 users, \$299.95; 5-10 users, \$499.95; 11-20 users, \$749.95; and 21 or more users, \$949.95; retail. (For additional product details, circle 329 on one of the Free Information Cards.)

KEEPTACK PLUS version 1.2 is a hard disk backup utility designed to offer several times the speed of the IBM DOS backup utility, with the added feature of integrated file management. Features of the program include: the incremental backup of the files worked on most recently; an include-exclude capability that tells the program to back up or not to back up specifically identified files; the ability to manipulate backup commands; the ability to copy, move, rename, delete, and change a variety of parameters for organizing backups; on-screen menus for simplified operation; restoration from batch files; and network backup. The memory requirement is 360k. *The Finot Group, 2390 El Camino Real, Palo Alto, CA 94306; (415) 856-2020; \$79 direct order. (For additional product details, circle 330 on one of the Free Information Cards.)*

KEYNOTES is a memory-resident utility package designed to act as an on-screen support program. According to the manufacturer, one keystroke puts the application on hold, guides the user to the necessary information through an on-screen window, and then restarts the application. The program serves as a combined documentation package, information-retrieval program, and built-in help system inside of IBM PC applications. Features of the program include: a word/key phrase search feature; and, according to the manufacturer, the ability to exchange text files with almost any word processor. The memory requirement is 35k. *Digital Learning Systems, Inc., 4 Century Drive, Parsippany, NJ 07054; (201) 538-6640 or (800) 992-0264; \$100 retail. (For additional product details, circle 331 on one of the Free Information Cards.)*

LOTUS EXPRESS FOR MCI MAIL is a communications package designed to enable users to exchange messages and application files with increased speed. The program can run as a RAM-resident or stand-alone product, and enables users to transmit any binary file from a spreadsheet, data base, word processing, or graphics program. The memory requirement is 256k in the stand-alone mode; 640k is recommended if it is run concurrently with another program. *Lotus Development Corp., 55 Cambridge Parkway, Cambridge, MA 02142; (617) 577-8500; \$100 retail, including a one-year MCI Mail subscription. (For additional product details, circle 332 on one of the Free Information Cards.)*

THE NON-VOLATILE RAM-DISK, a system designed to provide improved performance for disk-intensive applications, combines im-

For more product information, please circle the appropriate number on one of the Free Information Cards that are located facing the Product Index within the product review section or opposite the Advertiser's Index.

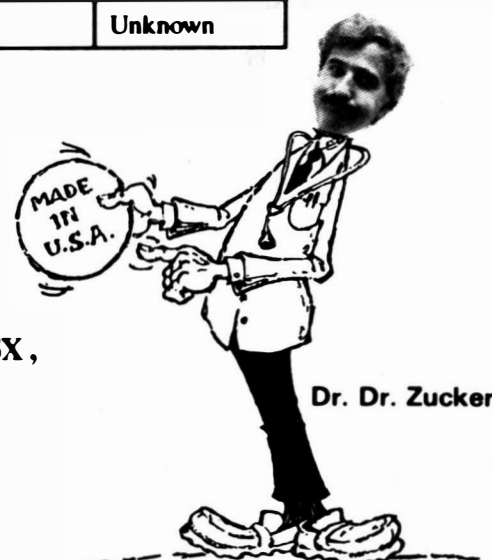
New From Zuckerboard 20 Mega Byte Hard Disk Card \$599 vs. \$799

Compare Ours to Theirs

	ZUCKERBOARD	TANDY
Price	\$599	\$799
Availability	Now	Soon
Warranty	2 Years	90 Days
Installation	Preformatted for Plug & Play	Need to Format
Reliability	3x More Reliable Than a Seagate	Unknown
Access Time	66 Millisecond	Unknown
Slot Usage	1 Slot	Unknown

Fits in the Tandy 1000, the new SX, and 3000 computers.

Installation as easy as 1-2-3 open the box, plug in and play.



Dr. Dr. Zucker

It's another ZUCKERBOARD



235 Santa Ana Court • Sunnyvale, CA 94086 • (800) 233-6874 (CA) • (800) 222-4920

ZUCKERBOARD is a registered trademark of Advanced Transducer Devices Inc. Tandy 1000/1200 are Trademarks of Radio Shack, a Division of Tandy Corporation.

All prices subject to change without notice due to fluctuations in the chip market.

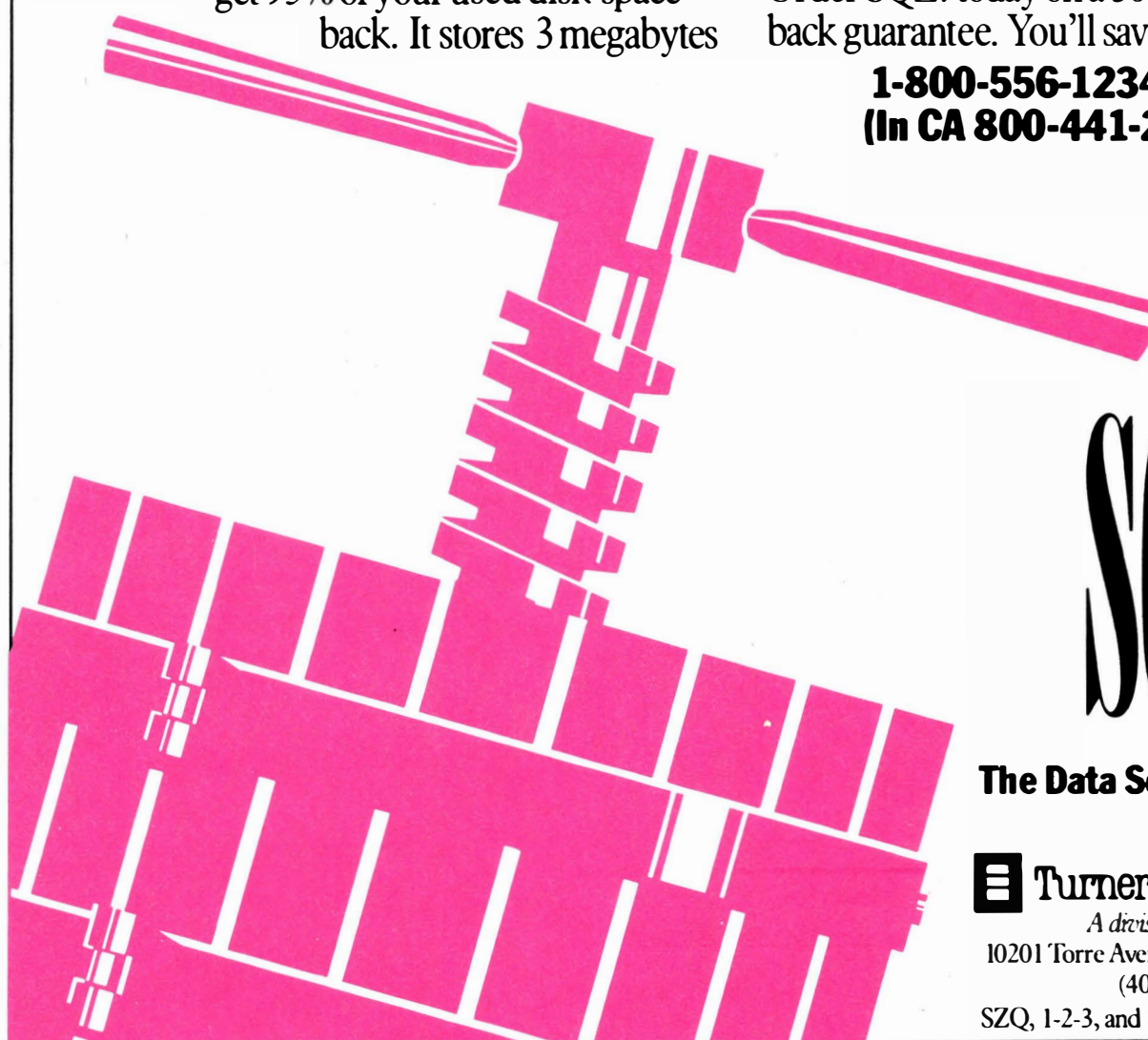
(For More Information Circle 173)

\$79.95 Hard Disk.

Almost. It's SQZ!, the ultimate reducing program for 1-2-3, Symphony, and V.P. Planner. SQZ! squeezes spreadsheet files by up to 95%. So you get 95% of your used disk space back. It stores 3 megabytes

on a 360K floppy. And 100 megs on a 10 meg hard disk. Working in the background (memory resident) or the foreground, without you lifting a finger. Order SQZ! today on a 30 day, money-back guarantee. You'll save a ton.

1-800-556-1234 x527
(In CA 800-441-2345 x527)



SQZ!

The Data Squeezer for Lotus

Turner Hall Publishing

A division of Symantec
10201 Torre Avenue Cupertino, CA 95014
(408) 253-9607

SQZ, 1-2-3, and Symphony are trademarks.

(For More Information Circle 194)

PRODUCT LISTINGS

proved performance with the non-volatility of a hard disk. The non-volatile copy of the RAM disk is kept in a special file on the hard disk, called the backing file; the working copy is kept in expanded memory. The working copy is temporarily lost when the computer is booted, the manufacturer says, but the backing file remains valid. The working copy is recovered from the backing file and remains valid while the computer is operating. When a program writes to a non-volatile RAM disk, the non-volatile RAM disk updates both copies of the data. The program is designed to work with expanded memory hardware or with the Virtual Expanded Memory Manager (V-EMM). The memory requirement is 192k; an IBM fixed disk drive and fixed disk adapter, and EMS board or V-EMM (or both) are also required. *Fort's Software, PO Box 396; Manhattan, KS 66502; (913) 537-2897; \$49.95 direct order, or \$119.90 direct order, bundled with V-EMM. (For additional product details, circle 333 on one of the Free Information Cards.)*

OVERSEER is a program designed to take the place of the computer's operating system prompt. The package eliminates the blinking system prompt, directory paths, and program names. When the computer is booted, the manufacturer says, Overseer automatically presents up to 56 of the programs contained on either the floppy or the

hard disk. The names of all 56 programs are displayed on the screen for easy selection by number. Once a program is chosen, Overseer loads and runs it. When you're finished with the application, Overseer redisplay the program list and waits for another selection to be made. The memory requirement is 20 to 30k (stand-alone) or 100k (RAM-resident). *MTI Software, a division of Morton Technologies, Inc., PO Box 1659, 600 B St., Santa Rosa, CA 95402; (707) 523-1600 or (800) 624-1197; \$18.75 retail. (For additional product details, circle 335 on one of the Free Information Cards.)*

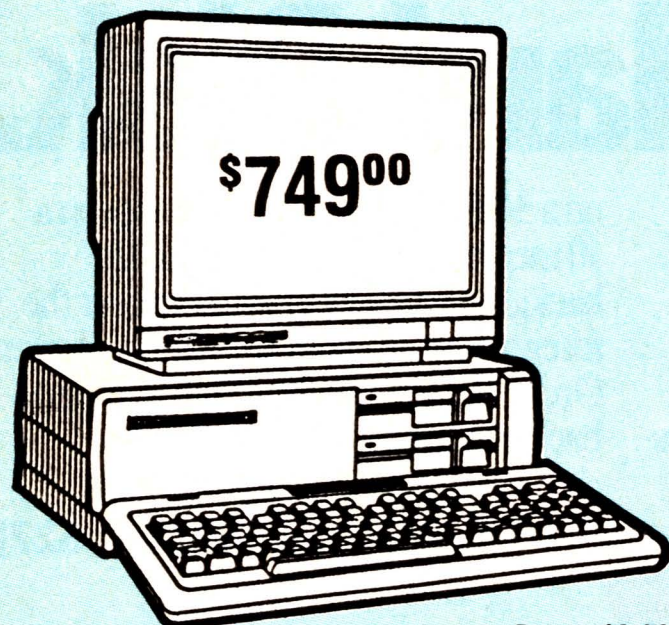
PCEASY is a pop-up file storing and retrieval utility designed to provide an easy method of organizing information. The user can enter up to 32 characters, including spaces between words, punctuation and upper- and lowercase letters to label a file. According to the manufacturer, the program alleviates other DOS difficulties by using the following methods: the program organizes the hard disk by using a filing cabinet system where each subdirectory is called a drawer, a sub-subdirectory is called a folder, and a file is simply a file; file retrieval is performed by keying in the first letter of the selection or by using a highlighted bar pointer. The program also includes a DOS shell main menu, designed to enable the user to select DOS commands, programs, and batch files by pointing to the option on the menu. DOS

commands are automatically entered by the program, and applications located on the hard disk are loaded automatically. The memory requirement is 256k. *Transec Systems, Inc., 220 Congress Park Drive, Suite 200, Delray Beach, FL 33445; (800) 423-0772 or (305) 276-1500; \$74.95 direct order. (For additional product details, circle 336 on one of the Free Information Cards.)*

PRINTKEY version 1.1, is a printing utility package designed to provide access to the features of any printer from within any software program. Features of the program include more than 250 prewritten drivers that provide access to the features of laser, dot matrix, daisywheel, and ink jet printers; and a macro editor for modifying or creating new drivers. The memory requirement is 24k. *NorthWest Software Associates, 12469 East Olive, Spokane, WA 99216; (509) 928-2361; \$89.95 retail. (For additional product details, circle 339 on one of the Free Information Cards.)*

PROJECT PCB is a computer-aided design (CAD) package designed to provide schematic capture, board layout, and auto-routing capabilities. Features of the program include: user-definable schematic and silk-screen symbols; user-definable footprints to .001-inch accuracy; block move; copy and delete functions; screen display of unrouted traces on the board; tag and drag function in interactive routing mode; four-

Tandy 1000 SX Computer



Reg. 1199.00

Now your business can have PC compatibility at a fraction of the price! Runs virtually all MS-DOS® software at speeds up to fifty percent faster than the IBM® PC! Includes MS-DOS 3.2 and DeskMate® II 6-in-1 software, two 5 1/4" disk drives, 384K RAM and 5 card slots. #25-1051

*TM Microsoft Corp. IBM/AT International Business Machines Corp. Monitor extra

- ✓ Expansion Boards by STB & Others!
- ✓ Save on TANDY, Epson, and Okidata Printers!
- ✓ Save on all your TANDY, and non-TANDY software needs!
- ✓ Authorized Sanyo Computer Dealer!



TANDY AMERICA'S

#1

COMPATIBLES

YOU WILL BE PLEASED

ONE CALL DOES IT ALL

CALL TOLL FREE

FOR ORDERS:

1-800-44SHACK

FOR COLORADO
RESIDENTS AND
INFORMATION
CALL 303-249-9125.

(For More Information Circle 170)

GREAT WESTERN ELECTRONICS

228 MAIN, MONTROSE, COLO. 81401

HOURS 9-5 MST, MON.-FRI.

Tandy 3000 HD Computer



20 Megabyte
512K Memory
Reg. 3599.00

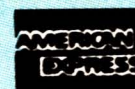
40 Megabyte
640K Memory
Reg. 4299.00

The affordable alternative to the IBM® PC/AT! Runs virtually all popular MS-DOS® software. Complete with your choice of 20 or 40-megabyte hard disk, 5 1/4" slim-line floppy disk drive, and memory expandable up to 12 megabytes. Come in now for a demonstration! #25-4010/#25-4011 TM International Business Machines Corp. *MS-DOS/Reg. TM Microsoft Corp. Monitor extra

SAVE 20-40%

OFF List on all

TANDY & Other Equipment!





Rave Reviews

Apple IIe/IIc compatible

The Laser 128 is a smashing success.

"A Clear Winner" – A+ Magazine

"A Remarkably Compatible, Competent Performer" – InCider Magazine

"A Better Value" – Computer Shopper

The Laser 128 Apple-compatible computer is a successful hit with its audience. Industry publication reviews make it clear – the Laser 128 is a hot ticket. The Laser 128 is made to grow like an Apple IIe, designed to go like an Apple IIc and priced to go like a Commodore. And, only the Laser 128 has all these performance features: 128K RAM, built-in floppy disk drive, serial and parallel printer interfaces, mouse interface, modem interface, 80-column text, numeric keypad **and an expansion slot**. These leading features make the Laser 128 a headline performer with a style perfect for home, school or business use. Get the Laser 128 performing for you. Call or write for the name of your nearest Laser 128 dealer.

**VIDEO TECHNOLOGY
COMPUTERS, INC.** 

400 Anthony Trail, Northbrook, IL 60062-2536 Telephone: 312 272-6760

Apple, Apple IIe, and Apple IIc are registered trademarks of Apple Computer, Inc. Commodore is a registered trademark of Commodore Business Machines, Inc.

PRODUCT LISTINGS

layer boards; two signal layers plus internal planes; single net or full board auto-routing; plot routines for camera-ready artwork; and predefined libraries of parts and symbols. The memory requirement is 640k; a monochrome, Hercules, AST or equivalent adapter, or IBM Color Graphics Adapter or Enhanced Graphics Adapter, and a Mouse Systems, Microsoft, or AT&T mouse are also required. *Dasoft Design Systems, Inc.*,

PO Box 8088, Berkeley, CA 94707-8088; (415) 486-0856; \$950 direct order. (For additional product details, circle 340 on one of the Free Information Cards.)

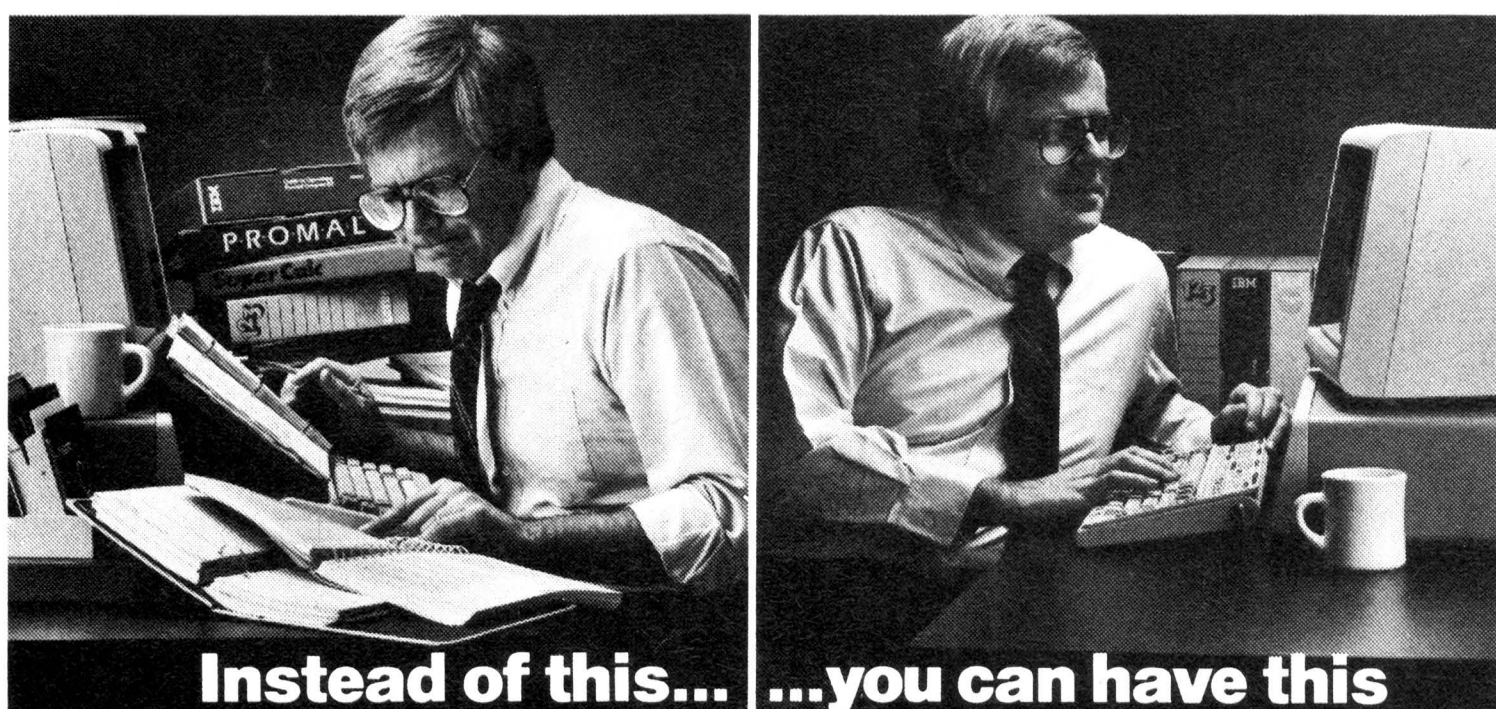
PROSPECT TRACKER is a utility program created specifically for marketers who need to keep track of prospects and clients. The program is designed to organize and store information on the user's customers and prospects, and retrieve information in a format

the user establishes. Prospect Tracker stores company name and address, client status, publications mailed, in-house contact(s), last contact date, next contact date, and comments. The program has the ability to provide the user with callback checklists. The memory requirement is 256k. *MTI Software, PO Box 1659, 600 B St., Santa Rosa, CA 95402; (707) 523-1600 or (800) 624-1197; \$225 retail.* (For additional product details, circle 341 on one of the Free Information Cards.)

PC IMAGE is an image processing package that can run under Microsoft Windows and support most popular desktop publishing programs. Functions of the program include: scanner support drivers, including the JetReader feeder scanner and Model 730 platen base scanner; image file management, including save/load, file format conversion, compression/decompression; and image processing, including half-toning, thresholding, and scaling. PC Image will support Datacopy's standard .IMG image file format as well as PC Paintbrush 3.0. It will also support the Windows Tag Image File Format (TIFF). The combination of file formats will permit PC Image to be used with most PC-based desktop publishing software that accept images. The memory requirement is 640k. *Datacopy Corp., 1215 Terra Bella Ave., Mountain View, CA 94043; (415) 965-7900; \$495 retail.* (For additional product details, circle 337.)

SOFT LEATHER SALES ASSISTANT, a record-keeping package for sales professionals, is designed to organize files, remember appointments, and help the salesperson maintain an accurate prospect and mailing list. Functions of the Sales Assistant include: creating and revising prospect lists; sorting through prospects by location, type of business, or other factors designated by the user; maintaining a perpetual appointments file; reminding the user of scheduled appointments up to one week in advance; generating labels from the mailing list; and creating reports on any standard printer or on-screen. The memory requirement is 256k. *Planet Computer Services, 5600 Roswell Road, 118 Prado West, Atlanta, GA 30342; (404) 843-2527; \$149 retail.* (For additional product details, circle 343 on one of the Free Information Cards.)

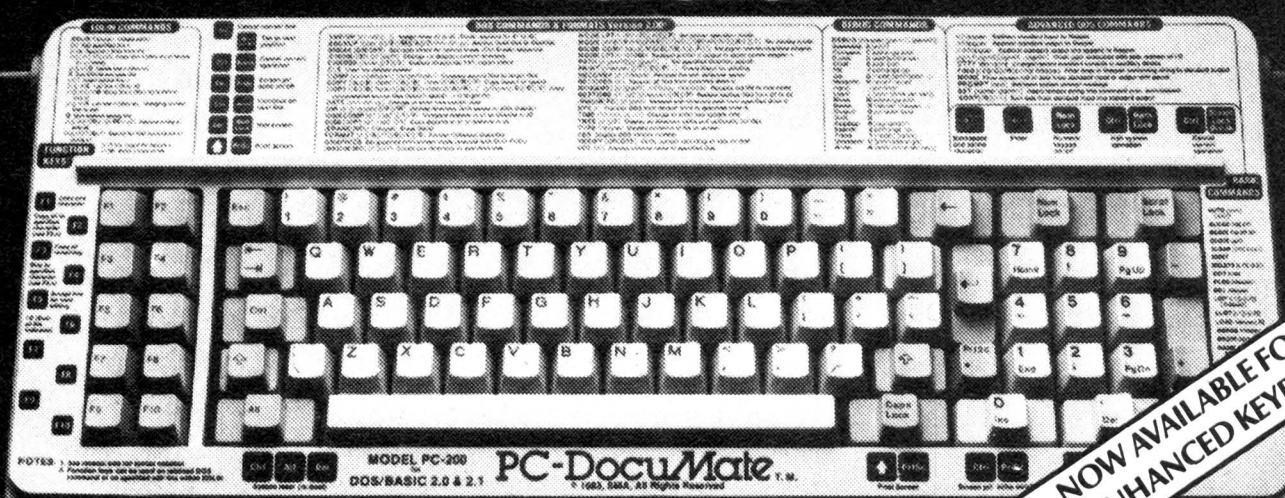
SOLVEIT version 1.3, a numerical problem solving system, is designed for scientists and engineers who need to solve complicated numerical problems. Features include: sketching of functions; four sophisticated methods of numerical integration; and root finding and data analysis. The problem solving environment is represented as an RPN calculator. SolveIt can be used in the same way as a calculator, but it has more features, such as the ability to build any number of custom calculators that can be used for specific scientific, engineering or business applications. According to the manufacturer, the user can arbitrarily sketch complicated functions, solve the functions over the desired range, and can also build very large macros. Newly added features include data scattering, differential equation



Instead of this...

...you can have this

with this!



\$14.95

NOW AVAILABLE FOR
IBM ENHANCED KEYBOARD.

Never forget another command with PC-DocuMate™ templates to remind you. **Save time and end frustration** because commands and formats are at your fingertips for **quick and easy reference**.

SMA's expertly designed, two-sided plastic templates are **easier to use** than booklets or reference cards. The data is complete, it's **properly organized** to help you, and it's available at a glance.

Over 500,000 PC-DocuMates are in use today—at home, and at work in America's major corporations—like IBM, AT&T, GM, Kodak, GE, Exxon, Xerox, Citibank, and hundreds more.

So order your PC-DocuMates today with confidence and join our **thousands of satisfied users**—who never forget a command.

How To Order

Select templates by program and keyboard style. Call for other software not listed here.

PROGRAM	STYLE
DOS 2.0/2.1	A B C D E
DOS 3.0/3.1	A B C D E
Lotus 1-2-3	A B C D E
Multipan 2.0/3.0	A B C D E
dBASE III	A B C D E
dBASE III +	A B C D E
R: Base 5000	A B C D E
Symphony	A B C D E
DisplayWrite 3	A B C D E
Lotus Manuscript	A B C D E
Microsoft WORD	A B C D E
MultiMate	A B C D E
MultiMate Advantage	A B C D E
WordPerfect 4.1/4.2	A B C D E
WordStar 4.0	A B C D E
WordStar 2000 +	A B C D E
VolkWriter 3	A B C D E
Do-it-yourself*	A B C D E

(Partial list, call for more)

*Comes with Free pen & eraser.

Keyboard styles available:
A = IBM PC, PC/XT, COMPAQ
B = IBM PC/AT
C = AT&T 6300
D = Keytronic 5151
E = IBM Enhanced **New!**

Ask your Computer Dealer or to order by credit card call toll-free:

1-800-762-7874
(In NC call 919-878-3600)

Call today or mail us your personal check, money order or MasterCard/Visa/American Express information. NC residents include 5% sales tax. Please add \$2.00 for shipping and handling per order. (For foreign orders add \$20.00. Canada and Puerto Rico add \$4.50). U.S. funds only. No CODs.

Attention Corporate Customers: Call for quantity discounts or quotations on **custom** templates to meet your special needs.

NO-RISK, Full 60-Day Moneyback Guarantee: Use your template for a full 60 days. If you are not completely satisfied return it to us (undamaged) for a refund.

Dealer Inquiries Invited.



Systems Management Associates, Inc.
3325 Executive Drive, Dept. PC-9
Raleigh, North Carolina 27609

(For More Information Circle 201)

solving, Hercules graphics compatibility, and program editing. The memory requirement is 512k. *Structured Scientific Software, Inc., PO Box 7011, Bend, OR 97708; (503) 389-1847; \$79 retail.* (For additional product details, circle 344 on one of the Free Information Cards.)

UNISON FONTPAK, a set of five fonts for use with the Unison Author Language, has italic, round, deco, digital, and hollow typestyles. The Unison Author Language is a programming language that's designed for the production of computer-based training materials. Among the features of the language are graphics with color and animation, response analysis, and the ability to control devices such as a mouse and videodiscs. The memory requirement is 256k. *Courseware Applications, Inc., 475 Devonshire, Champaign, IL 61820; (217) 359-1878; \$49 retail.* (For additional product details, circle 347 on one of the Free Information Cards.)

LEISURE

THE CHESSMASTER 2000, for the Macintosh, is a chess program with 20 different levels of play, from neophyte to grandmaster. Included in the program is a chess algorithm and an opening collection of more than 71,000 moves. Other features include a teach mode that enables The Chessmaster to demonstrate moves, two- and three-dimensional graphics, and a window that displays captured pieces. The program has on-screen clocks, and joystick and mouse control. The memory requirement is 512k. *The Software Toolworks, One Toolworks Plaza, 13557 Ventura Blvd., Sherman Oaks, CA 91423; (818) 907-6789; \$44.95 retail.* (For additional product details, circle 348 on one of the Free Information Cards.)

COMPUTERIZED GARDENING, for the Macintosh, provides gardening information and plant lists by both scientific and common name. All the data is organized by zip code for the user's specific gardening climate. After you enter a zip code, the program enables you to: select categories for flower color, growing conditions, watering requirements, plant height, and blooming season; access a computerized plant encyclopedia; call up a planning calendar and diary; and access a calculator to determine garden and landscape dimensions. The memory requirement is 128k. *Ortho Information Services, 575 Market St., San Francisco, CA 94105; (415) 894-1981; \$49.95 retail.* (For additional product details, circle 349 on one of the Free Information Cards.)

DGI WORD SEARCH PUZZLE enables the user to create custom word-search puzzles. The user enters one to 40 words and the program creates the puzzle. The program is menu driven and enables the user to create puzzles in any size from 15-by-15 to 20-by-40 characters. The memory requirement is 128k. *Decision Graphics, Inc., PO Box 2776, Littleton, CO 80161; (303) 796-0341; \$25 retail.* (For additional product details, circle 350 on one of the Free Information Cards.)

HOLLYWOOD HIJINX, for the Macintosh, is an

interactive fiction game in which you have the starring role in a feature produced by your Hollywood mogul uncle, Buddy Burbank, and his wife, Aunt Hildegard. The production is not a movie, but rather an adventure in which you attempt to inherit their estate. You can claim your inheritance if you find 10 treasures hidden throughout their sprawling Malibu mansion. You lose the inheritance if you can't find all of the treasure in one night. The Malibu mansion is pure Hollywood—a gaudy round bed, bathroom faucets in the shape of Oscars, and a private screening room. The "treasures" you seek are props from old Buddy Burbank films. The memory requirement is 128k. *Infocom, Inc., 125 Cambridge Park Drive, Cambridge, MA 02140; (617) 492-6000; \$39.95 retail.* (For additional product details, circle 351 on one of the Free Information Cards.)

LOC, for the Macintosh, is a program that includes four strategy games played on a hexagonal game board; the four games are Loc, Match, Simple Match, and Catch Me. You can play against other people, against the computer at various skill levels, or have the computer play against itself. Players of any game can choose their pieces from more than 50 that come on the disk, most of which are animated. They can also use the piece editor to change any existing pieces or create new ones. The memory requirement is 512k. *Great Wave Software, 104 Gilbert Ave., Menlo Park, CA 94025; (415) 325-2202; \$49.95 retail.* (For additional product details, circle 352 on one of the Free Information Cards.)

PURRSONAL CHALLENGE is a trivia game run by a cat named Trivia Kitty. Players have a choice of personalities they can assume; most are not friendly, and some are designed to be insulting. These game personalities include Nagging Nellie, Mean Marty, Sexy Sadie, Wiseguy Willie, Hippy Harry, Charming Charlie, and Sweet Sue. The personalities are frustrated musicians who hum tunes in both appropriate and inappropriate places. One to six players can choose a subject area, and then answer a question in that area. The questions are multiple choice, and the computer makes comments on the answers given. The memory requirement is 256k. *Softworks, Inc., 100 Varick St., New York, NY 10013; (212) 219-2812; \$24.95 retail.* (For additional product details, circle 353 on one of the Free Information Cards.)

STAR FLEET1—THE WAR BEGINS is a strategic space simulation in which players become members of the Alliance and protect its outer reaches against the invading fleets of hostile aliens. Players belong to the Star Fleet Officers Academy. Each new level in the academy gives players the opportunity to assume the role of characters and experience tasks unique to the training level. The package contains an academy training manual and an officers' manual. The memory requirement is 128k. *Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404; (415) 571-7991; \$49.95 retail.* (For additional product details, circle 354 on one of the Free Information Cards.)

DISKETTES

5 1/4" PC-Pack

100% Tested & Certified Error Free, at "Minimum 55% Clipping Level or Higher." "Lifetime Warranty." Poly-Bagged in Fifty & Made in the U.S.A. With Tabs, Labels & Tyvek Sleeves

Double Side-Double Den.

.28 each (100) .39¢ each
(250) .34¢ each
(1000+) (500) .31¢ each

Shipping Charges Vary With Quantity Call

Delaware 1-800-451-1849
P.O. BOX 10247, WILMINGTON, DE. 19880
Oklahoma 1-800-654-4058
P.O. BOX 1674, BETHANY, OK. 73008
Nevada 1-800-621-6221
P.O. BOX 12396, LAS VEGAS, NV. 89112
Minimum Order 25.00 - Visa, MasterCard accepted, COD add 3.00. UPS delivery. US Mail for APO, FPO, AK, HI, or PR add 5% additional for PAL.

Verbatim®

WITH "ANTI-STATIC" DATAHOLD PROTECTION

QUANTITY DISCOUNTS

5 1/4" Diskettes
S-Side 7⁹⁵ D-Side 9⁹⁵
D-Den. min. 3 bx. D-Den. min. 3 bx.

S-Side 15⁷⁵ D-Side 18⁷⁵ High 20⁹⁵
96 tpi 96 tpi Den.

3 1/2" Diskettes
S-Side 12⁹⁵ D-Side 17⁹⁵

8" Diskettes
S-Side 15⁴⁰ S-Side 17⁹⁵ D-Side 20⁹⁵
S-Den. D-Den. D-Den.

Delaware 1-800-451-1849
P.O. BOX 10247, WILMINGTON, DE. 19880
Oklahoma 1-800-654-4058
P.O. BOX 1674, BETHANY, OK. 73008
Nevada 1-800-621-6221
P.O. BOX 12396, LAS VEGAS, NV. 89112
Minimum Order 25.00 - Visa, MasterCard accepted. C.O.D. orders add 3.00. Surface Shipping: 3.50 for 5 1/4" and 3.00 for 3 1/2" disks. 4.00 for 8" disks. UPS delivery only. U.S. only. For APO, FPO, AK, HI or PR add an additional 5% for PAL. Prices subject to change without notice!

maxell®

FLOPPY DISKS

5 & 10 box Quantity Discounts

3 1/2" DISKS

3 1/2" S-Side 11⁰⁰

3 1/2" D-Side 17²⁰

8" DISKS

S-Side 19⁹⁵

D-Side 21⁹⁵

5 1/4" DISKS

S-Side 7⁹⁵ min 3bx

D-Side 9⁹⁵ min 3bx

S-Side 15⁹⁵ 96 tpi

D-Side 19⁵⁰ 96 tpi

HIGH DEN. 19⁹⁵

Delaware 1-800-451-1849
P.O. BOX 10247, WILMINGTON, DE. 19880
Oklahoma 1-800-654-4058
P.O. BOX 1674, BETHANY, OK. 73008
Nevada 1-800-621-6221
P.O. BOX 12396, LAS VEGAS, NV. 89112
Minimum Order 25.00 - Visa, MasterCard accepted. C.O.D. orders add 3.00. Surface Shipping: 3.50 for 5 1/4" and 3.00 for 3 1/2" disks. 4.00 for 8" disks. UPS delivery only. U.S. only. For APO, FPO, AK, HI or PR add an additional 5% for PAL. Prices subject to change without notice!

(For More Information Circle 164)



"Serving the Nation's Capitol
and the World"



ITS TEK-NET-BBS (703) 690-7462

Open 7 days a week
(703) 847-4740 (800) 642-2395

Information and Technology Services, Inc.

Micro Systems Specialists
8478A Tyco Rd., Vienna, VA 22180

Visa, MC, CHOICE, AE
Leasing, Renting &
Financing available

Drives		Printers		Memory Boards	
20 MB SEAGATE 65MS	\$379	NEC P-6	\$465	JRAM 2	\$129
30 MB SEAGATE RLL	\$479	NEC P-7	\$670	JRAM 3 ABOVEBOARD	\$179
20 MB ST4026 AT	\$573	NEC P-5	\$1107	JRAM AT	\$179
30 MB ST4038 AT	\$651	NEC P-5XL	\$1230	JRAM AT3 ABOVEBOARD	\$239
40 MB ST4051 AT	\$792	PANASONIC 1080 I	\$220	JLASER MODULE	\$265
80 MB ST4096 AT	\$1273	PANASONIC 1091 I	\$284	JLASER +	AVAIL.
40 MB PRIAM XT	\$1395	PANASONIC 1092	\$345	INTEL ABOVEBOARD	\$438
60 MB PRIAM XT	\$1450	PANASONIC 1592	\$465	AST RAMPAGE 512K	\$485
40 MB PRIAM AT	\$1175	STAR LV 1210	\$174	ORCHID CRAMRAM	\$291
60 MB PRIAM AT	\$1350	STAR NX-15	\$368	ZUCKER BOARD	\$68
BERNOULLI DUAL 10	\$1839	STAR ND-15	\$430	AST 6 PAK + W/384	\$210
BERNOULLI DUAL 20	\$2494	STAR NR-15	\$522	QUADBOARD W/384	\$199
20MB PLUS HARDCARD	\$695	STAR NB 24-15	\$684		
20MB MAYNARD HCARD	\$759	STAR SD-10	\$340		
ISI WORM 220MB INT.	\$2995	STAR NX-10	\$240		
60MB ARCHIVE TAPE	\$740	BROTHER 1509	\$425		
60MB ARCH. EXT. TAPE	\$740	CITIZEN MSP-10	\$305		
60MB GENOA TAPE	\$935	CITIZEN MSP-15	\$420		
60MB SYSGEN	\$1089	CITIZEN PREMIER 35	\$470		
TOSHIBA 3.5 DRIVE	\$150	TOSHIBA P341	\$820		
*TOSHIBA 5.25 EXT.	\$349	TOSHIBA P351	\$1212		
FUJITSU 360 K DRIVE	\$89	FUJITSU DLP24	\$1224		
		FUJITSU DM91	\$398		
		OKIDATA M182	\$264		
		OKIDATA M192 +	\$397		
		OKIDATA M193 +	\$598		
		OKIDATA M84	\$698		
		OKIDATA 2410	\$1961		
		EPSON FX-286	\$609		
		EPSON LX-80	\$270		
		EPSON FX-85	\$419		
		EPSON LQ-800	\$616		

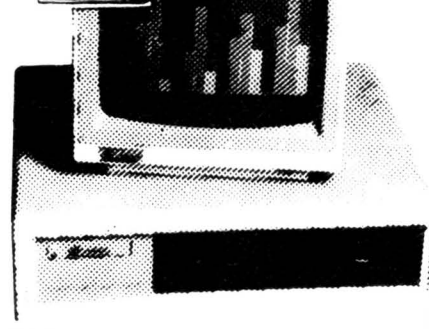
Laser Printers

CANON A1	\$2095
CANON A2	\$3085
HP LASERJET	\$2295
QMS KISS	\$1995
XEROX 4045	\$CALL

\$

Chips

64K 150ns set of 9	\$8
64K 120ns set of 9	\$9
256K/150ns set of 9	\$23
256K/120ns set of 9	\$25
64 x 4	\$4
128K Piggyback	\$5
8087-3	\$119
8087-8	\$169
80287 6MHz	\$192
80287 8MHz	\$306



"Editor's Choice"

PC MAGAZINE
OCT. 14, 1986

The ITS Turbo XT
from Information and
Technology Services
is our "best buy"
recommendation

\$849⁰⁰

with complete
20MB and 1 floppy

\$1157

ITS Turbo XT

1 year warranty
30 day money back guarantee

IBM® PC Compatible

ITS TURBO 286 AT

\$1195⁰⁰

- Phoenix ROM BIOS
- Full one year warranty
- 80286 CPU switch select-able 6 or 8 Mhz (10 Mhz optional)
- 1.2 MB Floppy Disk Drive
- Supports up to 5 internal 1/2 HT drives
- 2 serial/1 parallel ports built into chassis
- real time clock • 8 expansion slots and many more features
- 6/10 Mhz optional \$1295



PANASONIC BUSINESS PARTNER



FX-600 2DS/DD, 640K

\$895

with 1 DS/DD, 20 MB

\$1145

(Monitor and Adapter extra)

PRICING SENSATIONS!

20 MB SEAGATE DRIVE	\$379
30 MB SEAGATE DRIVE	\$479
SAMSUNG AMBER MONITOR	\$79
NEW ENHANCED KEYBOARD	\$79
MONO GRAPHICS CARD	\$90

OTHER SYSTEMS

BIOS AT 8Mhz	\$1769
SPERRY MICRO IT	\$1795
IBM XT	\$1195
IBM AT	\$2395
1800 + AT (EVEREX)	\$1195

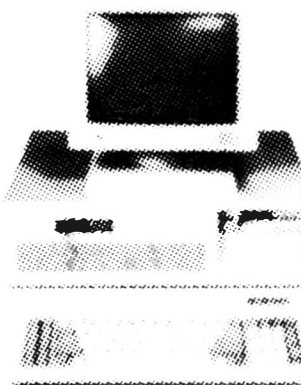
ITS SYSTEM 386 BLACKHAWK

Features:

- INTEL 80386 CPU and support circuits
- INTEL designed motherboard
- Phoenix BIOS
- 18 Mhz clock speed
- PC/AT compatible 8 Mhz switchable from keyboard
- 512K RAM standard up to 14 megabytes
- Parallel/Serial/Clock
- 8 Slot Expansion bus interface
- 2-PC Compatible 8 bit bus connectors
- 2-32 bit bus connectors
- Hard disk/Floppy disk controller
- 1.2 megabyte floppy

Available now

\$3995⁰⁰



LAPTOPS and ACCESSORIES

Toshiba T1100 w/640	\$1745
Toshiba 3800	\$3395
Sharp PC 7000	\$995
NEC Multispeed	CALL
Zenith 181	CALL
Panasonic Exec. Partner	CALL
Centronics GLP II Printer	\$215
Toshiba Ext. Drive	\$349
Toshiba 1200 Modem	\$336

NOVELL NETWORKING DESIGN & INSTALLATION

- Prices subject to change 1/16/87
- 10% re-stock fee on all items
- Software non-returnable if opened
- No surcharge on VISA, MC, CHOICE... AE 3%

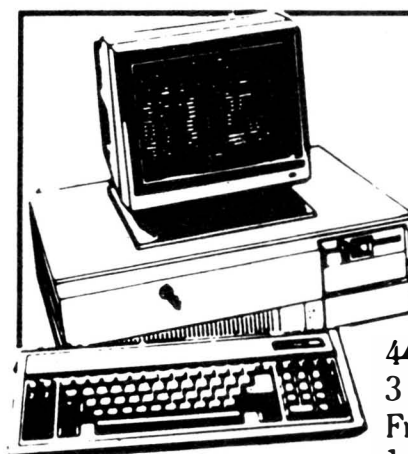
SPERRY PC/IT

Superior to the IBM AT
Rated 8.8 by InfoWorld

44MB, 28ms Access Hard Drive
3 Speed Processor
Free 8 Mhz Math Coprocessor
1.2MB Floppy, 640K Ram
2 Serial/1 Parallel Ports
Clock/Calendar, AT Keyboard
DOS 3.1 Basic, System Guide

\$2,695⁰⁰

1 year warranty



PRODUCT INDEX

(Continued from page 146)

Turbo Prolog, (ADV) Cover 2, Circle 40
Twist and Shout, Page 143, Circle 29
What's Best, Page 139, Circle 284
Word for Word, Page 156, Circle 259
XYZ Consolidate, Page 139, Circle 286.
XYZ Query, Page 139, Circle 286
XYZ Spread, Page 139, Circle 286
Your Move, Page 141, Circle 285

■ LEISURE

Chessmaster 2000, Page 193, Circle 348
Computerized Gardening, Page 193, Circle 349
DGI Word Search Puzzle, Page 193, Circle 350
Hollywood HiJinx, Page 193, Circle 351
LOC, Page 193, Circle 352
Math Rabbit, Page 184, Circle 247
Purrsonal Challenge, Page 193, Circle 353
Star Fleet 1-The War Begins, Page 193, Circle 354

■ OPERATING SYSTEMS

Desqview 2.0, Page 72, Circle 370
Merge 386, Page 72, Circle 374
PC-MOS/386, Page 72, Circle 371
VM/386, Page 72, Circle 372
VP/ix, Page 72, Circle 373
Xenix System V/386, Page 72, Circle 375

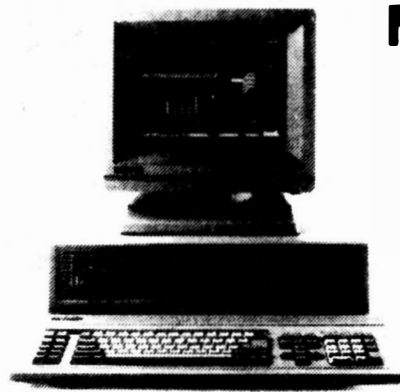
■ MISCELLANEOUS

The Active Investor, Page 187, Circle 320
Business Strategist, Page 178, Circle 235
Captain's Log, Page 188, Circle 324
DBarCode, Page 182, Circle 240
Eureka, (ADV) Cover 3, Circle 41
Family Roots, Page 182, Circle 242
FormWorx, (ADV) Page 146, Circle 152
Flow Charting II, Page 182, Circle 243, (ADV) Page 184, Circle 203
Homebase, Page 184, Circle 245
LegalEase, (ADV) Page 9, Circle 171
Market Manager Plus, (ADV) Page 45, Circle 78
Non-Volatile Ram-Disk, Page 189, Circle 333
1,2,3 Forecast, (ADV) Page 20, Circle 181
PC Manager, Page 186, Circle 311
Prism, Page 186, Circle 313
Professional Handicapping Systems, (ADV) Page 174, Circle 156
Reader-PC, Page 186, Circle 314
Real Estate Investment Templates, Page 187, Circle 315
Rolodex Software, (ADV) Page 161, Circle 28
SCIX Investment Software, (ADV) Page 50, Circle 193
Soft Leather Sales Assistant, Page 192, Circle 343
SolveIt, Page 192, Circle 344
SPSS/PC+, (ADV) Page 31, Circle 80
Taxease, (ADV) Page 172, Circle 191
Unison Fontpak, Page 193, Circle 347

SERVICES

Computerbanc, (ADV) Page 195, Circle 185
Computer Direct, (ADV) Page 132, Circle 101
Computer Discount Warehouse, (ADV) Page 131, Circle 89, Page 129, Circle 59
CompuServe, (ADV) Page 173, Circle 100
Dialog Business Connection, (ADV) Page 135, Circle 65
Diskette Connection, (ADV) Page 193, Circle 164
Great Western Electronics, (ADV) Page 190, Circle 170
InfoMaster, (ADV) Page 21, Circle 29
Information and Technology Services, (ADV) Page 194, Circle 91
P.C. Computer Brokers, Inc., (ADV) Page 188, Circle 178
PC Network, (ADV) Page 126, Circle 63
Prentice Hall Personal Computer Book Club, (ADV) Page 163, Circle 27
Warehouse Data Products, (ADV) Page 198, Circle 35
Zephyr Services, (ADV) Page 184, Circle 162

SAVE ON BUSINESS SYSTEMS



Multitech Accel 900 AT Compatible

- 6/10mhz Switchable Speeds
- 80286 Processor
- 30meg Hard disk, 512K, 1.2meg Floppy
- Monographics & Soft. White display
- 2 Parallel, 2 serial, clock/calender
- 8 slots *Dos 3.1
- FCC Approved *Incl. Free software

\$2499

MULTITECH PLUS 700 2 drives \$775.00

CALL FOR COMPLETE CATALOG CUSTOM CONFIGURATIONS ON ANY SYSTEM!! SYSTEMS

XT 8mhz Turbo 20MB 969.00
XT 4.77mhz Floppy Drive System 669.00
IBM PC AT 6Mhz 30MB drive, 512K3, 100.00
IBM PC AT 8Mhz 30MB Drive, 512K CALL
IBM PC XT 20MB drive, 640K 1669.00
Sperry IT 44MB drive, 1 Meg 2,800.00
Compag Deskpro 286 30MB drive 2,999.00
Toshiba Systems CALL

IBM SOFTWARE

LOTUS 123 CALL
Symphony CALL
ASHTON TATE dBASE III Plus CALL
Q & A CALL
CLIPPER dBASE III Compiler 355.00
LATTICE C COMPILER 265.00
LET'S C Compiler 49.00
SUPERCALC IV 275.00
MULTIMATE ADVANTAGE CALL
MICROSOFT Multiplan 119.00
Word CALL
Windows 65.00
DOS 3.2 W/GW basic 69.00
Quick Basic 65.00
BORLAND TURBO PASCAL W/Bcd 60.00
REFLEX CALL
LIGHTENING 59.00
Superkey 41.00
Sidekick 50.00
NORTON UTILITIES 55.00
FASTBACK 95.00
CROSSTALK XVI 99.00
MIRROR Comm Software 49.00
PEACHTREE Back to Basics 199.00
OPEN SYSTEMS CALL
BPI General Accounting 299.00
ACCOUNTING PARTNER 199.00
MONOGRAM DOLLARS & SENSE 99.00
TOBIAS MANAGING YOUR MONEY 99.00
DAC EASY ACCOUNTING 45.00
PFS First Choice 89.00
PFS Professional Write 115.00
PFS Professional File 145.00
SATELLITE WORD PERFECT 209.00
WordStar 2000 PLUS 299.00
GENIFER CALL
RBASE System V 370.00
FUNK SIDEWAYS 39.00

HARDWARE

AST 6 pack Plus W/384K 210.00
6 pack premium W/256K 289.00
RAMPAGE CALL
HERCULES MONO Graphics Plus 195.00
Intel Above Board CALL
JRAM 3 CALL
Microsoft Mouse W/Stwr 117.00
Mouse Systems Mouse 119.00
Turbo 286E 749.00
Genoa spectrum SAVE

Spectra EGA SSAVE
Paradise Autoswitch EGA 388.00
Quadram EGA+ 349.00
Multifunction card 384K, S, P, Clk 139.00
AT Multifunction card 0K-3MB 175.00
Monochrome graphics card 85.00
Color graphics card 69.00

DRIVES/TAPE DRIVES

20 MB Seagate drive 369.00
30 MB Seagate for XT 449.00
30 MB drive for AT 625.00
360 K Floppy for AT 110.00
Teac 55B 99.00
20 MB Hard Card 429.00
Plus Hard card CALL
Mountain Hard card CALL
10 MB Irwin 329.00
20 MB Irwin 429.00
Everex Stream 20 569.00
GENOA 60MB tape B/U SAVE
ALLOY CALL

PRINTERS

PANASONICKX-P1080i CALL
KX-P10911 SAVE
KX-P1092 CALL
KX-P1592 399.00
KX-P1595 240 CPS CALL
KX-P3131 17cps Daisy 249.00
KX-P3151 22cps Daisy 385.00
Citizen MSP-10 275.00
EPSON All Models CALL
BROTHER-1509 369.00
HR-20 Daisy wheel 369.00
OKIDATA-All Models CALL
TOSHIBA All Models CALL
CANNON Laser Printer 1,999.00
HEWLETT PACKARD LAZER 2,199.00
HOUSTON INSTRUMENTS CALL

MONITORS/MODEMS

Amdex 310 A 149.00
Color 600 389.00
Color 722 RGB 720 X 350 499.00
Princeton Graphics HX-12 399.00
HX-12E (Enhance graphics) 499.00
MAX-12 149.00
TAXAN all models CALL
NEC Multisync CALL
IBM Compatible Monochrome 89.00
Color RGB Monitor (640 X 200) 269.00
Anchor Lightning 2400 299.00
Volksmodem 1200 (5 yr wrnty) 139.00
Volksmodem 1200 Internal 120.00
Hayes 1200 379.00
2400 CALL
Prometheus 2400 359.00
Promodem 1200 239.00
Promodem 1200B 179.00



COMPUTERBANC

6951 Warner Ave.,
Huntington Beach, CA 92647

ORDERS
ONLY

800-322-BANC

OUTSIDE
CALIFORNIA

714-841-6160

TECH
SUPPORT

714-847-BANC

Cash prices indicated. We guarantee all items for 30 days. Within this period, defective merchandise returns must be accompanied by RMA number. All other returns will be subject to a 15% restocking fee. For prepaid orders, there will be a 3% shipping charge; 5% for UPS Blue Label; \$5.00 minimum; California residents add 6% sales tax.

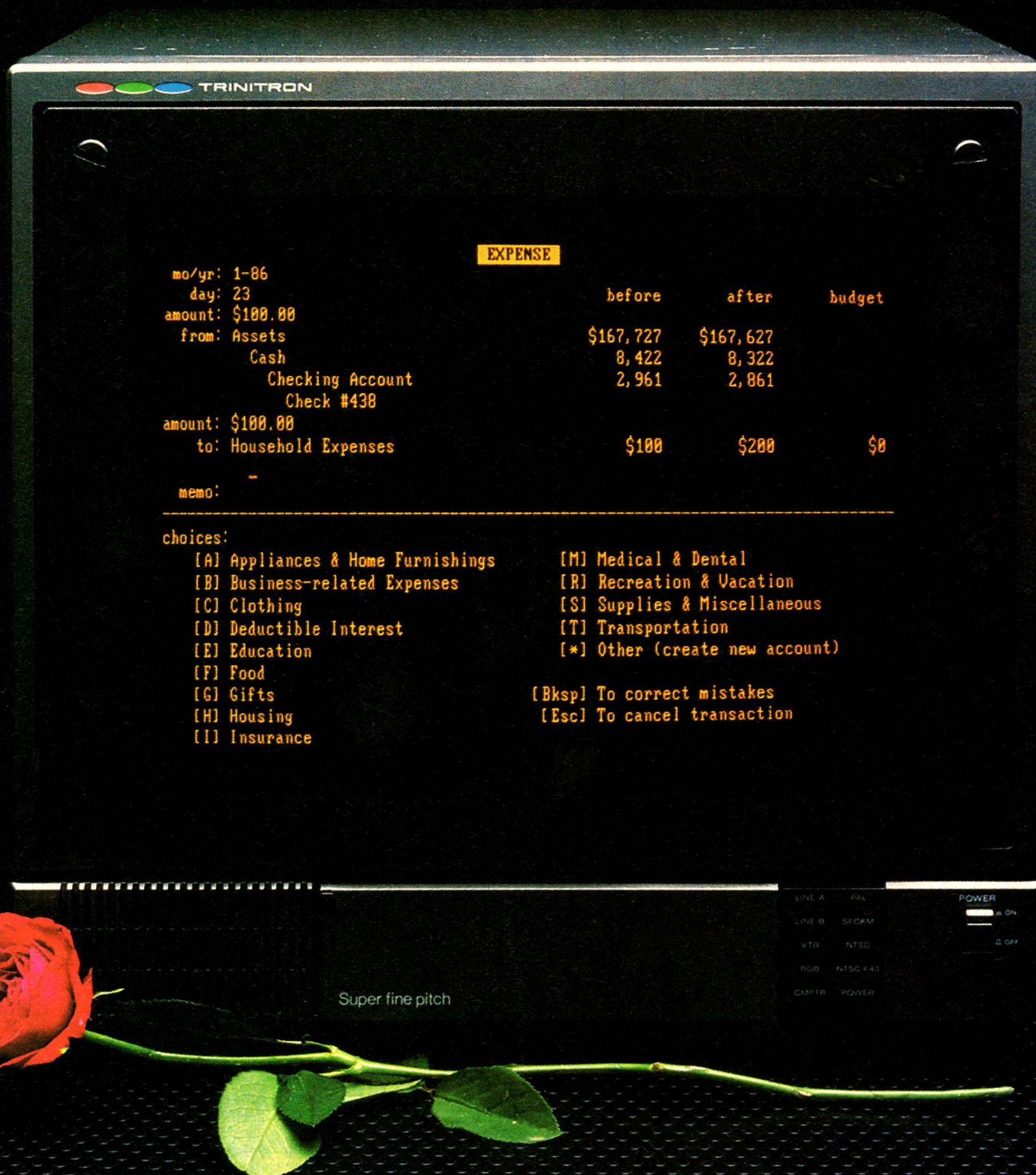


Prices are subject to change W/O Notice
©Copyright 1985 Computerbanc
All rights Reserved



(For More Information Circle 185)

OUTSTANDING



If slow and cumbersome program operation has kept you
laughing (and frustrated) about using a personal computer for home accounting ...

Finally, an Outstanding Home-Accounting System! CashTrack™

CashTrack redefines home accounting with an easy-flowing
yet versatile accounting structure, a beautiful concept for presenting unaccounted-for-
outflow, and an execution speed that makes other "home-
accounting" packages obsolete.

Take CashTrack for a Test Drive at your dealer. You will be
convinced; CashTrack has no competition.

Now Hard Disk Compatible!

See Your Dealer. Most dealers have been set up with special hands-on instructions to
guide you through all aspects of program use in thirty minutes
or less. If your dealer doesn't have these instructions, write or call SubLOGIC for more
information. For direct orders, please enclose \$149.00 plus
\$4.50 for shipping and specify whether you want UPS or first class mail delivery. Visa,
MasterCard, American Express, and Diners Club accepted.

CashTrack

subLOGIC
Corporation
713 Edgebrook Drive
Champaign IL 61820
(217) 359-8482 Telex: 206995
ORDER LINE: (800) 637-4983
(except in Illinois, Alaska and Hawaii)
Open 7 AM to 9 PM Central Time

Safeguarding A Hard Disk

Q: In the November 1986 issue of *PERSONAL COMPUTING*, I read about using batch files to avoid accidentally formatting a hard disk. I recently added a hard disk to my computer and made the mistake of using the `DEL *.*` command while in the C drive. Is there a batch file or other method I can use to prevent this problem from happening again?

A: When you issue the `DEL *.*` command, DOS asks you if you are sure you want to perform the command. It is all too easy to answer in the affirmative without first checking to see if you are in the proper drive or directory. You can write a batch file that offers additional layers of protection before the `DEL *.*` command is executed. Unfortunately, you can't simply modify the `DEL` command. The batch file detailed here incorporates the `DEL` command, but must be executed by typing the name of the batch file and not the `DEL *.*` command. You can still use the `DEL` command, but you will only be asked once if you are sure you want to proceed.

You create batch files by using the `COPY CON` command or the `EDLIN` command in DOS or by using your word processor, provided you can save the file in ASCII format. Using the `EDLIN` command or your word processor is a better option if your file is more than a few lines long, since these two options enable you to edit any line of the file. With `COPY CON`, however, there's no way to edit the contents of a line once you move to another line. `COPY CON` is a fast and simple way to write short files, though, and is probably the best method for them.

Here is what the batch file looks like, beginning with typing in the `COPY CON` command:

```
COPY CON SAFEBAT <CR>
PATH \ <CR>
REM THIS COMMAND DELETES THE CONTENTS OF YOUR
DISK OR DIRECTORY <CR>
REM MAKE SURE YOU ARE IN THE PROPER DIRECTORY OR
DRIVE BEFORE CONTINUING <CR>
REM IF YOU ARE CERTAIN THIS IS THE PROPER DIRECTORY
<CR>
PAUSE <CR>
DEL *.* <CR>
^Z <CR>
```

The first line of the file (path \) sets

SHORTCUTS

Transferring PFS Files

The item in the "Answers" section of the December issue of *Personal Computing* about converting files from PFS:File to another Macintosh data base program caused me to dig out my method for transferring files from PFS:File and PFS:Professional File for MS-DOS computers to other formats.

If you have access to PFS:Write, a delimited ASCII file can be generated using the mail-merge feature, printing a one-page document for each record. For example, the text should appear as follows:

"FIELD NAME 1","FIELD NAME 2"

Note also that you are not limited to two field names. The top and bottom margins should be set at zero, the left margin at one, and the right margin at 78. Unfortunately, the maximum left margin on the MS-DOS version of PFS:Write is 78 (255 in Professional Write), so this will limit the length of files that can be created. It will work well if there are a large number of fairly small files to be copied.

Mail-merge can also be used to create a delimited ASCII file that duplicates one of the fields (a feature that PFS: Professional File does not have). I discovered this when restructuring files to duplicate a field in the first position for faster search/sort, while leaving the same information in another field in the correct position for printing mailing labels. (PFS requires that the file fields be in the same order as they are printed on the label.)

If the records are too long to fit in the maximum line length permitted by PFS:Write or if PFS:Write is not available, another alternative is to use the label print option on PFS:File, setting page length at one and printing to a disk file. This will create an ASCII file with two spaces between each field. You must be careful with this operation because null fields will not be printed and a delimited ASCII file should show "". Any null fields should be filled with something.

The file can then be "fixed" using any word processing program. A search/replace feature makes this much easier, particularly one with a wild-card function that will permit a search for "?", replace it with "", and then inserting the quote mark at the beginning and end of each line. This may not be the most satisfactory solution; however, it's preferable to spending between \$50 and \$150 for new software, and is certainly faster than keying in all the files again.

You may also want to do a bit of experimentation in setting up a delimited ASCII file with a few records to get a feeling for what works.

*Richard Wallace
Spartanburg, SC*

Tell us your shortcuts. Do you know a faster, more efficient way of doing something? Let's hear from you! We'll publish the best shortcuts we receive. Write: "Shortcuts," PERSONAL COMPUTING, 10 Mulholland Drive, Hasbrouck Heights, NJ 07604. Include your address and phone.

Order Status,
Technical & Other
Info. (602) 246-2222

Call for programs
not listed



SPECIAL
WORD PERFECT
\$195

TOLL-FREE ORDER LINE 1-800-421-3135

FREE SOFTWARE! FREE SOFTWARE! FREE SOFTWARE!

Purchase over \$100 and receive one of these disks absolutely FREE! Purchases over \$250 get two free disks, over \$400 get three, or get all four disks when your purchase is over \$500! **1) MIXED BAG** — A great assortment of utilities and games all packed on one disk. **2) PC-WRITE** — Try this famous feature packed word processor. It's a winner! **3) FONT-SET** — Lets you set popular fonts like bold, underline, etc. on most late model printers from Citizen, Epson, NEC, Okidata, Panasonic, Star, Toshiba, etc. You can even use your printer like a typewriter! **4) ABC-LIST** — Great mailing list program! Sort on any field, do qualified searches, print reports and mailing labels, and more!

DATA BASE MANAGERS

Clipper.....	\$329
Clout 2.....	Call
Condor III.....	310
Knowledgeman II.....	Call
Powerbase 2.2.....	212
Q&A.....	Call
Quickcode.....	138
Quicksilver.....	295
Quickreport.....	138
Revelation.....	469
R: Base System V.....	Call

WORD-PROCESSING

Easy Extra.....	88
Microsoft Word.....	252
Multimate Advantage.....	Call
Peachtext 5000.....	145
Volkswriter 3.....	139
Webster Spellcheck.....	37
Wordstar.....	162
Wordstar Propac.....	233
Wordstar 2000.....	233
Wordstar 2000+.....	278

SPREADSHEET

Microsoft Multiplan.....	108
Spreadsheet Auditor 3.0.....	82
Supercalc 4.....	Call
VP Planner.....	49

ACCOUNTING

BPI AP, AR, PR, GA.....	299 ea.
Cyma.....	Call
Dac Easy Accounting.....	39
Dollars & \$ense.....	94
Managing Your Money 3.0.....	108

INTEGRATED

Ability.....	59
Enable.....	312
Smart Software.....	Call

**COMMUNICATION
PROGRAMS**

Carbon Copy.....	115
Crosstalk.....	89
Remote.....	89
Smartcom II.....	83

GRAPHICS

Chartmaster.....	199
Energraphics 2.0.....	269
In-A-Vision.....	275
Microsoft Bus Mouse.....	106
Microsoft Chart.....	164
Microsoft Serial Mouse.....	119
Newsroom.....	31
PC Mouse W/DR Halo II.....	106
Printshop.....	33
Signmaster.....	Call

PROJECT MANAGER

Harvard Total Project.....	262
Microsoft Project.....	219

Super Project Plus.....	Call
Timeline 2.0.....	\$209

EDUCATIONAL

Flight Simulator.....	28
Turbo Tutor II.....	25
Typing Tutor III.....	Call

LANGUAGES

Lattice C Compiler.....	242
Microsoft C Compiler.....	249
Microsoft Fortran.....	195
Microsoft Macro Assembler.....	84
Microsoft Pascal Compiler.....	166
Microsoft Quick Basic.....	55
Ryan McFarlan Fortran.....	305
Ryan McFarlan Cobol.....	479
Turbo Pascal w/8087 + BCD.....	55

UTILITIES

Copy II PC.....	19
Copywrite.....	39
Desqview.....	55
Double Dos.....	Call
Fastback.....	85
Homebase.....	39
Microsoft Windows.....	55
Norton Utilities 3.1.....	48
Prokey 4.0.....	70
Sidekick (unprotected).....	47
Sideways 3.1.....	36
Superkey.....	39
Traveling Sidekick.....	39
XTree.....	27

ACCESSORIES

Copy II PC Board.....	75
135 watt power supply.....	59
Mini Micro Parallel Print Buffer.....	69
Masterpiece.....	88
Masterpiece Plus.....	113

INCREDIBLE VALUES

Nationally advertised boards for IBM PC and most compatibles at give away prices.
Keyboards (similar to 5151).....\$79
Monochrome Board w/printer port (similar to Hercules Graphics).....\$79
Expansion Board 0 to 576K.....\$42
Multifunction Board w/game port (similar to AST six pack).....\$79
Four Drive Floppy Controller.....\$39
Color Card w/o printer port.....\$69
Color card w/printer port.....\$79

HARD DRIVES

Bernoulli 20 MB w/cont.....	Call
Filecard 20 MB.....	555
Maynard 20 MB Hard Card.....	Call
Plus Hardcard 20MB.....	665

Seagate 20 MB Int. w/cont.....	\$385
Seagate 30 MB Int. w/cont.....	479
Seagate 30 AT Int.....	Call

KEYBOARDS

Keytronics 5151.....	162
Keytronics 5153.....	269

PRINTERS

CANON LASER..... 1939

CITIZEN

MSP-10.....	279
MSP-15.....	379
MSP-20.....	315
Premiere 35 Daisywheel.....	469

EPSON - Call on all models

FUJITSU

DX2100 Parallel.....	Call
DL2400 Ser/Par.....	Call
LASER IMAGE 2000.....	Call

NEC

NEC P5XLP.....	1095
NEC P7 Parallel.....	619
NEC 8850.....	1059
NEC P6 Parallel.....	439

OKIDATA - Call on all models

PANASONIC

1091-I.....	259
1092.....	299
1592.....	425
KXP3151.....	399

STAR MICRONICS

NP10.....	Call
NB15.....	975
NX10.....	232
SG15.....	365
SR15.....	585

TOSHIBA - Call on all models

MONITORS

AMDEK 410 Amber.....	157
AMDEK 600.....	395
Magnovox Color RGB.....	Call
Multitech Color RGB.....	259
Princeton Max 12.....	159
Samsung TTL Amber.....	72
Samsung TTL Green.....	70

EGA MONITORS

AMDEK 722.....	502
NEC Multisync.....	Call
Packard Bell EGA.....	450

EGA BOARDS

Everex Enhancer EGA.....	235
Paradise Auto Switch EGA Card.....	359
Quad EGA Plus.....	349
STB EGA Plus.....	Call
Vega Deluxe.....	Call
Vega Video.....	299

RAM

64K 150NS (set of 9).....	10.50
256K 150NS (set of 9).....	27
256K 120NS (set of 9).....	Call

MODEMS

Everex 300/1200.....	120
Hayes 1200.....	Call

Hayes 1200B.....	Call
U.S. Robotics Courier 2400.....	\$349
U.S. Robotics Passwd. 1200.....	180

BOARDS

AST Advantage Premium.....	Call
AST Premium.....	359
AST Sixpac (384K).....	Call
Hercules Color Card.....	145
Hercules Graphics +.....	182
Intel Above Boards.....	Call
J Lazer (Tall Tree).....	Call
J Ram III (Tall Tree).....	159
J Ram III AT (Tall Tree).....	199

COMPUTERS

AZ TURBO PC

IBM Compatible Computer, 4.77 or 7.47 key selectable, keyboard, 640K, dual drive, 150 watt power supply.....620
or with 20 MB Seagate Harddrive..... Call
6 month limited warranty

Corona PC..... Call

Multitech 900 Accel

IBM AT Compatible, 512K, expandable to 1 MB on the mother board, one 1.2 MB drive, 195 watt power supply, MS/DOS 3.1, clock, 6 or 10 MHZ key selectable, soft white monitor, AT style keyboard, 1 year TRW warranty..... Call

Multitech Turbo

IBM Compatible Computer, 256K, dual drives, 8 MHZ, ports-parallel-serial-clock, 5151 type keyboard, graphics board (similar to Hercules), mono monitor DOS 3.1, 6 month national warranty..... Call

Packard Bell VT286

IBM AT Compatible, 640K, expandable to 1 MB on the mother board, one 1.2 MB drive, 210 watt power supply, MS/DOS 3.1, clock, 6 or 8 MHZ, AT style keyboard, 1 year warranty.....1600

Sharp Portable..... Call

TERMS: Shipping on most software is \$5.00. AZ orders +6.7% sales tax. Personal check -allow fourteen (14) days to clear. We accept purchase orders from authorized institutions for 3.5% more than cash price. All returns are subject to our approval. There will be a 20% restock fee. Minimum phone order \$50. All prices are subject to change.

No Charge for Master Card or Visa



We do not guarantee compatibility

TOLL-FREE ORDER LINE 1-800-421-3135

WAREHOUSE DATA PRODUCTS

2701 West Glendale Ave. • Phoenix, AZ 85051

Phone Hours: Monday, Wednesday & Thursday
7 am-9 pm; Tuesday & Friday 7 am-5 pm;
Saturday 9 am-5 pm. MST.

up a PATH command to find the batch file, which we put in the root directory, regardless of the directory we are in. The PATH command enables us to activate the batch file from any directory. If we didn't have the PATH command, we would need to copy the file into every directory. That is because there are two types of DOS commands—internal and external. Internal commands, such as DEL and COPY, are RAM resident and are available from any directory. External commands, such as batch files and the FORMAT command, are not RAM resident and therefore must be executed from the disk.

The second, third, and fourth lines in our batch file explain what the command is about to do. REM at the start of each line tells DOS not to interpret the line as a command. These lines provide fuller protection than the DEL *.* command, which simply asks, ARE YOU SURE? Y/N. The PAUSE command puts a message on the screen telling you to strike any key when ready. This gives you ample time to digest the remarks in lines two through four. Line six leaves you just short of actually activating the command. As a final check, you are asked ARE YOU SURE? Y/N.

The ATTRIBUTE command offers another method of protection. To use this command, type ATTRIB +R followed by the name of the file. To be able to write to and delete a file you've protected with this command, type ATTRIB -R followed by the name of the file.

Q: *I use an IBM PC AT at my office, with a Hayes 1200-baud modem and Smartcom II for communications; at home I use an IBM PCjr. What do I need for setting up communications between the two machines?*

A: You will first need to purchase a 1200-baud modem for your home computer. Because Hayes does not manufacture software for the IBM PCjr you should then consider either public domain or shareware communications software. Most public domain software

is available from local bulletin boards or from a PCjr users group in your area. If you download a public domain program, you're free to use it without paying a fee. If you go the users group route, chances are that you'll have to pay the price of a floppy disk to obtain the program. Shareware programs are similar to public domain software, but with a key difference. You're free to try a shareware program, but if you decide you want to keep it and use it, you are then required to pay the author a license fee (generally about \$25), for which you will receive a manual and technical support. One shareware program of note is Procomm, available from PIL Software Systems, PO Box 1471, Columbia, MO 65204.

The communications software you obtain will make it possible for you to transfer files between the two systems. If you don't know where to connect to a bulletin board, ask for assistance at your local computer store or call a users group in your area.

Q: *I own a Tandy 1000 computer with 256k of RAM, and two disk drives, and I use a Tandy DWP 210 daisywheel printer. When I use WordStar, version 3.31, the printer obeys all the commands, but gives a couple of extra rolls, up and then down, of the platen at the beginning and at the end of each line. What's the problem?*

A: Both Tandy and MicroPro, the manufacturer of WordStar, independently reached the same conclusion. The first thing that you need to check is whether or not you have the Tandy version of WordStar 3.31. To do this, you must look at the catalog number on your version; if the number is 2503170, you have the version that supports Tandy printers.

Second, make certain that you have run the install program correctly. Because the Tandy DWP 210 is not directly supported in WordStar version 3.31, you will have to run the custom installation option included in the printer setup section. Within the custom installation, the program will ask you a number of questions about the Tandy DWP 210 printer; the answers can be found in the printer's manual. If you don't have the manual or are having problems running the custom setup, Tandy suggests calling them directly at the Tandy hardware line, (817) 338-2394.

Finally, if you don't have the Tandy version of WordStar 3.31, MicroPro says that you must go to the setup pro-

gram and use the custom installation feature. You must first install for standard backspacing and then set the customization of printer feature. To do this, you must change the return line feed by changing the 0-A switch on the printer to 0-0. The return line feed should now read 0-D and 0-0.

Q: *I am looking for an on-disk collegiate dictionary that will enable me to type a word, press a key, and get a definition displayed on the monitor screen.*

A: Aren't we all! It certainly sounds good, but unfortunately, to the best of our knowledge, no dictionary of this type yet exists. Don't be fooled by the software titles that include the word "dictionary"—they really mean a spelling checker, a very useful tool, but not a dictionary with definitions.

We can't find anything resembling a stand-alone on-disk dictionary. Simon & Schuster Software, which makes the excellent Webster's Thesaurus, doesn't have any immediate plans for one. The Random House School Division, maker of the Random House Reference Set, a combined "dictionary" and thesaurus, has no plans for one either, but it is currently doing research on the possibility of marketing a true on-line dictionary. It should also be noted that the thesaurus included in Ashton-Tate's Multi-Mate Advantage provides a definition and labels the part of speech of each word it finds a synonym for. Since it doesn't give the etymology (word origin) or a list of definitions, however, it shouldn't be considered a full-fledged dictionary.

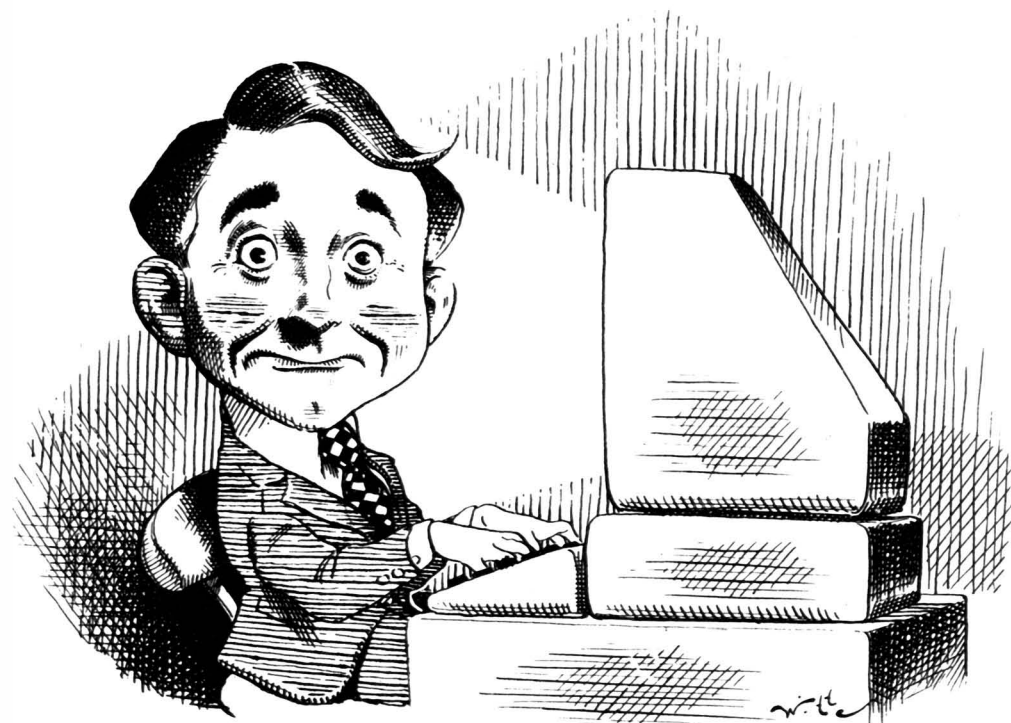
Q: *The "Speeding Hard Disk Access" story in the September issue states that the cluster size on a 360k floppy is 1,024 bytes. Later in the article, the size is listed as 4,096 bytes. Which of the two sizes is correct? Also, what is the size of a cluster on a hard disk?*

A: The cluster size on a 360k floppy is 1,024 bytes. A cluster is made up of sectors. A sector always contains 512 bytes. Although a sector is always the same size, the size of a cluster varies, depending on whether you have a 360k or a 1.2Mb floppy or a 10Mb, 20Mb, or higher-capacity hard drive. A cluster on a 360k drive, for example, is made up of two sectors, or 1,024 bytes. The cluster size on a 1.2Mb floppy is the equivalent of one sector, or 512 bytes. Hard disk clusters can vary in size: eight sectors (4,096 bytes) is common on a 10Mb drive, and on 20Mb drives they can be

If you have questions dealing with hardware or software, PERSONAL COMPUTING will answer them in this monthly column. Because of the volume of questions received, it's unfortunately not possible for us to send individual responses to each question. Send your questions to Answers, PERSONAL COMPUTING, 10 Mulholland Drive, Hasbrouck Heights, NJ 07604. Please include your address and your daytime telephone number.

Need Help?

Looking for information on a particular application or advice on how to solve a computing problem? During the past year **PERSONAL COMPUTING** magazine may have published an article that addresses needs you have now. Check the story(ies) you want, and see the form below for details on how to order.



Stories From Back Issues Of **PERSONAL COMPUTING**

SPREADSHEETS

- ☐ Spreadsheets Can Be Hazardous To Your Health
- ☐ Thinking Like A Spreadsheet
- ☐ Transferring Spreadsheet Data For Impact
- ☐ Bigger, Faster Spreadsheets
- ☐ Using A Spreadsheet As A Data Base
- ☐ Expanding Your Spreadsheets
- ☐ Failsafing Your Spreadsheets
- ☐ Avoiding Spreadsheet Disaster
- ☐ Building Simple Spreadsheets
- ☐ Forecasting Via Spreadsheets
- ☐ Getting The Most Out Of Your Spreadsheet
- ☐ How To Link Spreadsheets
- ☐ Moving Up With Spreadsheet Math

WORD PROCESSING

- ☐ Rebirth Of A Classic
- ☐ Upward Mobility
- ☐ XyWrite III 3.06
- ☐ Write Faster
- ☐ Stepping Up To A Laser
- ☐ How Wordsmiths Write Smarter
- ☐ Homegrown Newsletters
- ☐ Going Beyond Word Processing
- ☐ New Flash For The Company Newsletter
- ☐ Apple Writer II Test Drive
- ☐ How Word Processing Can Help Your Kids
- ☐ Pushing WordStar
- ☐ The Fine Art Of Formatting
- ☐ Volkswriter Deluxe Test Drive

COMMUNICATIONS

- ☐ On-Line Contacts
- ☐ Tracking Your Competition: The On-Line Edge
- ☐ Phone Directory Setups
- ☐ How To Set Up A Company Bulletin Board
- ☐ Making The Home/Office Connection
- ☐ Making On-Line Services Pay Off
- ☐ Communicating At Maximum Strength

- ☐ How Fast Are You Really Communicating?
- ☐ Modem Mistakes You Don't Have To Make
- ☐ Smarten Up Your Modem
- ☐ The 'Computerization' Of The Telephone
- ☐ Making A Habit Of Electronic Mail

GRAPHICS

- ☐ Visual Decision Making
- ☐ Driving Your Point Home
- ☐ Graphics Boards: What Can They Do For You?
- ☐ Making Quick Presentations
- ☐ Computer Graphics: Toys Or Tools?
- ☐ High-Powered Presentation Graphics
- ☐ Presentation Graphics

DATA BASES

- ☐ Paradox 1.1 Test Drive
- ☐ Building A Data Base
- ☐ Enhancing Your Data Base Reports
- ☐ Q&A Test Drive
- ☐ dBase III Plus Test Drive

DECISION SUPPORT

- ☐ Getting The Statistical Edge
- ☐ Managing Your Employees To Level 3
- ☐ Pushing Simple Filers To The Limit
- ☐ Get Organized
- ☐ The Desktop Environment
- ☐ When The Boss Gets A Computer
- ☐ Deciding About Decision Support

PERSONAL FINANCE

- ☐ Tax Strategies In The Age Of Reform
- ☐ Three Alternatives To Managing Your Portfolio
- ☐ Analyzing Those 'Other' Investments
- ☐ Planning Your Future: Beyond The Balanced Checkbook
- ☐ A Fast Way To Figure Your Taxes

- ☐ Should You Try Banking By Computer?
- ☐ The Bottom Line On Your Home Office
- ☐ Audited? You Can Be Prepared If You Plan Now
- ☐ Home Budgets Without Pain
- ☐ New Help For The Home Buyer
- ☐ The Big Board Connection

STORAGE

- ☐ Never Lose Data Again
- ☐ Reorganizing Your Hard Disk
- ☐ Data Storage: How Much Do You Need?
- ☐ How Hard Disks Can Save You Time & Space

PRINTERS

- ☐ The Hidden Power Of Your Printer
- ☐ Living With A Two-Printer Setup
- ☐ Getting The Most Out Of Your Printer

LINKING COMPUTERS

- ☐ Powerful Ways To Link The Small Department
- ☐ Realizing The Office Linkup
- ☐ The Department Linkup: Defining The Need
- ☐ Finally, Computer Networks That Really Work
- ☐ Tapping The Corporate Mainframe
- ☐ The Mainframe Connection

LEARNING

- ☐ Users Groups Get Down To Business
- ☐ Shortcuts in DOS, Lotus, WordStar, etc.
- ☐ Which Computer Camps Are Best?
- ☐ How Word Processing Can Help Your Kids
- ☐ Computers In Education: Promise And Reality
- ☐ Education's New Challenge
- ☐ Computer Seminars: Are They For You?

LEISURE

- ☐ Breaking Away
- ☐ Who Plays Adventure Games... And Why
- ☐ The Music Connection
- ☐ Games—The New Breed
- ☐ Software That Builds Do-It-Yourself Skills
- ☐ Buying Games? Go With The Classics

BUYERS GUIDES

- ☐ Internal Hard Disks
- ☐ Daisywheel Printers
- ☐ High-End Dot Matrix Printers
- ☐ EGA Boards And Monitors
- ☐ Non-Impact Printers: Thermals, Ink Jets And Lasers
- ☐ Word Processing Programs For Under \$150
- ☐ Hard Disk Backup Devices
- ☐ The New Spreadsheets
- ☐ Money Management Software
- ☐ Communications Software
- ☐ Data Base Management Software
- ☐ Data Base/Filer Software

COMPUTING IN AMERICA

- ☐ Milestones
- ☐ Standards
- ☐ Trends

- ☐ The Personal Computing 500
- ☐ Spreadsheets: The Way We Look At Numbers Has Changed
- ☐ Word Processing
- ☐ Data Bases: Why They're Finally Usable
- ☐ Communications
- ☐ Graphics
- ☐ Captains Of Computing
- ☐ Revitalizing The Small Business
- ☐ Today's Computer-Hip Generation
- ☐ The Impact On Today's Children
- ☐ Computers That Go Home
- ☐ Entertainment
- ☐ Technology At New Plateaus
- ☐ Compaq's Deskpro 386
- ☐ The New Operating Systems
- ☐ Anatomy Of A Product Rollout
- ☐ Presidents' Choice: Products With Punch
- ☐ The View From The Top
- ☐ Commentaries

SPECIAL REPORTS

- ☐ Buying Software
- ☐ Who's Who In Desktop Publishing
- ☐ Deciding On The Move Up
- ☐ Are You Ready For The Next Step Up?

PRODUCT REVIEWS

- ☐ Accent Expanded Memory Card
- ☐ Alpha/Three
- ☐ Balance Of Power
- ☐ C. Itoh ProWriter C-310 Printer
- ☐ ClickArt Personal Publisher
- ☐ Close-Up
- ☐ Compaq's Deskpro 386
- ☐ Compaq's Portable II
- ☐ ComputerLand BC88
- ☐ Cruise Control
- ☐ Desqview
- ☐ DriveCard
- ☐ Epson Equity I
- ☐ Epson FX-286 Printer
- ☐ Excel
- ☐ Financial Navigator
- ☐ For Comment
- ☐ Framework II
- ☐ GammaFax
- ☐ Genicom 18-Pin Dot Matrix Printer
- ☐ Hal For Lotus 1-2-3
- ☐ GEM Draw Plus
- ☐ Hardcard
- ☐ Hewlett-Packard QuietJet Plus
- ☐ Hot
- ☐ Hyper Access
- ☐ IBM's PC Convertible
- ☐ ITT Xtra/286 ATW (ITT 286)
- ☐ Image Maker
- ☐ Intelligent Backup
- ☐ Irwin Backup Model 325
- ☐ Leading Edge Personal Computer Model D
- ☐ Learning DOS
- ☐ Managing The Market
- ☐ Microsoft's Windows
- ☐ Microsoft Word
- ☐ Microsoft Works

Check the box beside each article you want and include \$2.00 per box checked. Make checks or money order payable to **PERSONAL COMPUTING**. Fill out your name and address in the space below.

NAME _____

STREET _____

CITY _____ STATE _____ ZIP _____

Number of stories checked _____

X \$2.00 = \$ _____
(total enclosed)

Mail this list (or a copy) to: "STORIES" **PERSONAL COMPUTING**,
10 MULHOLLAND DRIVE,
HASBROUCK HEIGHTS, N.J. 07604.

made up of four sectors (2,048 bytes) or as many as 16 sectors.

A simple experiment will show you what size cluster your hard disk has, and why cluster size is so important. Take a directory listing (`C>DIR`) of your root directory. Write down the number of free bytes. Then make a small file, perhaps containing a single character. Save the file. Take another directory of the root. Now notice the number of bytes free. If you subtract this number from the number of free bytes you had before you made the file, the resulting number will be your cluster size.

A file, no matter what its size, uses at least one cluster. Suppose your hard disk is set up so that 16 sectors are in one cluster. In this case, each cluster equals 8,192 bytes. A file that is only one character in size will, when saved, reduce the bytes you have available by 8,192. A file of that same size, saved on a hard disk with four sectors to each cluster, will only reduce the bytes you have available by 2,048. Thus, you are using the space on your hard disk more efficiently when the cluster consists of fewer sectors—this is something you should keep in mind if you're shopping for a hard disk.

It is deceiving to look at the byte count next to a file in a directory listing of the root area because even if the file is only 128 bytes, it can still occupy up to 8,192 bytes.

Q: *I would like to know how to print graphics using Lotus 1-2-3 on an IBM PCjr. When I try to print the graphs I create I get a "not enough memory" message—even though I have purchased additional memory. What gives?*

A: The source of the problem could be with the amount of memory in your system, the configuration of the 1-2-3 program, or a difficulty with the graphics fonts. The minimum memory required to run 1-2-3 on the PCjr is 256k, which you probably already have if you've added memory to the 128k of RAM that the PCjr comes with. Make sure you are using the setup program that comes with the memory upgrade to ensure that the system is "recognizing" this extra memory. Also, try using the `CHKDSK` command in DOS to see how much total and available memory it reports. If it's not about 256k, then the system is not recognizing the added memory.

Secondly, make sure that the 1-2-3 program is properly mated with your PCjr. It should be configured, for exam-

ple, to work with a color display and a graphics printer. Finally, the problem could be occurring because of an error with the graphic fonts. Because the PCjr has limited memory space it may be necessary to use a smaller font to print graphics. If all else fails, try calling the Lotus technical support group at (617) 253-9150.

Q: *Do any word processing programs have an automatic indexing utility?*

A: Yes. The latest versions of WordPerfect, Microsoft Word and WordStar 2000 all offer this feature, as do some other popular packages. Each will create an index for you through a designated series of steps. In WordPerfect 4.1, for example, you can create an index by marking blocks of text or by positioning your cursor to the word you choose for an index heading. You can create subtitles if you desire them. WordPerfect also allows you to choose from a menu of indexing styles. WordPerfect can alphabetize your index if you like. Version 3.0 of Microsoft Word and WordStar 2000 Plus offer similar functions, though the procedures for creating an index vary.

Q: *I've been having trouble getting my Tandy 1000 to boot up when the weather turns cold. Although I don't experience any problems during the rest of the year, when it's cold I sometimes get as many as eight boot failures before the computer will load DOS. What's the problem?*

A: As a general rule, your computer—like nearly every computer—needs to be at a temperature of between 65 and 85 degrees Fahrenheit (between approximately 20 and 30 degrees Celsius) to operate properly. If your computer is kept in the basement or in an office that is unheated when you are not working there, chances are that the internal parts will be colder than the recommended operating temperatures when you next try to boot the machine. It's a good idea to leave the machine on overnight (consider shutting it down over the weekend); simply turn the monitor off.

Q: *I have a Kaypro Model 16 with 640k of RAM. When I run Lotus 1-2-3 release 1A, I have more than 500k to work with on any given worksheet. The problem is this: Some of my worksheets still consume more than the available memory. Could you suggest some ways for me to use my available space more efficiently?*

A: According to the technical support group at Lotus Development Corp. in Cambridge, Mass., Lotus 1-2-3 does not

support Kaypro products and the company has yet to test ways for Kaypro owners to save valuable memory space when constructing worksheets. They did explain why Lotus 1-2-3 release 1A consumes as much memory as it does. The Lotus staff claims that the problem lies in the software. Let's say you want to create a worksheet with columns A-E on the horizontal axis; and columns 1-5 on the vertical axis. If you place a numerical value of 300 at point A1 and then another value, 500, at point E5, leaving all points in between empty, Lotus 1-2-3 release 1A will store the entire block from A1 to E5 instead of merely saving the columns containing a value. In turn, valuable memory space is consumed that could be saved and used for longer worksheets; the end result is a shortage of available memory.

There's a simple solution when using the more efficient 1-2-3 release 2.0. If you took the same example as mentioned above, release 2.0 would only open the cells in the columns in which there was a value; in this case columns A and E. If you made another chart in which there was a value at those same points and at the additional points (B1, C1, and D1), release 2 would open up all the cells in columns A and E while only opening cells B1, C1, and D1 in the other columns, saving a large portion of available memory.

Adding expanded memory to your system would not be a solution to your problem, since Lotus 1-2-3 release 1A does not work with expanded memory; release 2.0 does work with expanded memory cards.

To upgrade your current version of Lotus 1-2-3, call Lotus' upgrade department at 1-800-TRADEUP. They will send you a mailer that contains an order form and a return envelope in which you will have to return one disk of version 1A, along with \$15. Lotus suggests that you send your disk by registered mail to ensure its delivery.

Q: *Would you please print the address of Scarsdale Technologies, Inc.*

A: Scarsdale Technologies, a manufacturer of vertical-market software, is located at 238 King St. E., Toronto, Ontario, Canada. The telephone number is (416) 369-0332. ■

CORRECTION

In the January 1987 issue, reader Walter Norman's letter to the editor should have described his department using Compaq Deskpro 286s.

AD INDEX

Many of Personal Computing's advertisers will send further information about their products and services. Simply circle (on the Free Information Card) the bold number that appears to the left of the advertiser's name in the list below. If there is no number listed on the left kindly write or call the advertiser.

CIRCLE NO.	ADVERTISER	PAGE NO.
197	Adjustable Computer Products	182
198	Advanced Logic Systems	180
1	Amdek Corp.	40
152	Analytx International	46
202	Apparat, Inc.	184
	AST Research, Inc.	60-61
77	ATI Technologies	165
	Bay Express	130
39,40	Borland International	Cov2,3,4,Pg1
41,42	Businesssoft	25
2	Business Tools, Inc.	27
68	Calcomp	98
90	CH Products	179
3	Citizen America Corp.	110
192	Complete Computer Services, Inc.	187
	CompuSave	130
100	CompuServe	173
185	Computer Banc	195
101	Computer Direct	132-133
59,89	Computer Discount Warehouse	129,131
163	Computer Friends	13
50	Computer Support Corp.	114
	Computers International	130
60	Cougar Mountain	157
205	Crosspoint Systems	176
176	Cuesta Systems Corp.	14
	Curtis Mfg. Co.	Cov6
4	Dac Software	15
65	Dialog Business Connection	135
79	Diconix	4
189	Diskco Technology	156
164	Diskette Connection	193
78	Dow Jones Software	45
154	Dresselhaus Computer Products	14
61	Electric Software Corp.	153
	Electronic Protection Devices	128
81	Entre Computer Centers	28

CIRCLE NO.	ADVERTISER	PAGE NO.
	General Motors Corp.	106
6	General Parametrics	175
72	Good Software	80
170	Great Western Electronics	190
171	HDG Software	9
	HowardSoft	86
91	Information & Technology Services, Inc.	194
7	Intellisoft International	90
	Interstate Computer Bank	128
	Intuit	49
36	Liberty Electronics	66
	Lotus Development Corp.	6-7,36-37,88-89
8	Macropac International	33
	Maxell Corp. of America	2
26	Maynard Electronics	54
199	MicroCom Systems	52
186	Micron Technology	174
	MicroPro International	104-105
51	Microprose	94
69	Microstuf	17
52,53	Migent	100,169
37,38,43	NEC Home Electronics	122,149,151
54	NEC Information Systems	18
	NRI Schools	170-171
	New England Software	35
181	1,2,3 Forecast	20
44	Okidata	70
11,12	Panasonic	140,155
203	Patton & Patton	184
178	PC Computer Broker	188
93	PC'S Limited	76-79
63	PC Network	126-127
190	PC Sig	5
13	Peachtree Software	144
200	Peripheral Marketing, Inc.	182
172	Perma Power Electronics, Inc.	46
45	Persoft	53
27	Personal Computer Book Club/Prentice Hall	163
86	Plus Development Corp.	10-11
167	Polaris Software	20
184	Precursor	44
15,16	Princeton Graphics	116-117,166
156	Professor Jones	174

CIRCLE NO.	ADVERTISER	PAGE NO.
204	Qualstar	172
187	Quicksoft	172
76	QW Page	136
17,18	Radio Shack	102,142
151	Revolution Software	19
	Romanicus Corp.	128
28	Rolodex Corp.	161
	Safeware	172
193	SCIX Corp.	50
	Sertan Sanity, Inc.	186
	Silicon Specialties	134
201	SMA (Systems Management Assoc.)	192
	Software Publishing Corp.	42,159
161	Sourcemate	185
	Source Telecomputing Corp.	8
	Spinnaker Software	24,26
80	SPSS, Inc.	31
	Storage Research	183
46	Sublogic Corp.	196
56	Systems Plus, Inc.	177
	Tab Books	181
191	T&F Enterprises	172
33	Tech Personal Computers	22-23
169	Tele-Ware West	168
195	Time Value Software	178
	Toshiba America, Inc.	Cov5
	Transec Systems, Inc.	12
66,194	Turner Hall Publishing	59,189
	Unison World	112
22	US Robotics	47
57	Verbatim	57
58	Video Seven	124
94	Video Technologies	191
165	Votrax, Inc.	48
35	Warehouse Data Products	198
23	Wells American Corp.	51
29	Western Union	21
70	Xerox Corp.	38-39
179	Xyquest	16
162	Zephyr Services	184
	Zimco International, Inc.	186
173,174		
175	Zuckerboard ATD	185,187,189

ADVERTISING STAFF

EASTERN ADVERTISING DIRECTOR

Michael Weiskopf (201) 393-6163

REGIONAL MANAGERS

Biff Fairclough (312) 272-0919

Barbara Gough (408) 287-8670

Michael Masters (408) 287-8670

Vivian Ritondale (818) 761-8197

Thomas Trezza, Jr. (201) 393-6165

Michael Tupanjanin (201) 393-6165

ADVERTISING MANAGER

Pauline Scherer (201) 393-6420

ACCOUNT REPRESENTATIVES

Denise Lupinacci (201) 393-6421

David S. Lynn (201) 393-6424

Joseph J. Mennella (201) 393-6422

Beth Rasmussen (201) 393-6427

Michael R. Uliss (201) 393-6423

SALES SUPPORT MANAGER

Joy Nichols

SALES ADMINISTRATOR

Diane D. Mautz

SALES ASSISTANTS

Debbie Lorenz McDevitt

Barbara Kotowski

NATIONAL ACCOUNTS MANAGER

Debbie Barshay Jacobs (201) 393-6165

PERSONAL COMPUTING MAGAZINE

10 Mulholland Drive
Hasbrouck Heights, NJ 07604
(201) 393-6165

PERSONAL COMPUTING MAGAZINE

1625 The Alameda Suite 600
San Jose, CA 95126
(408) 287-8670



Start Right Here.

Smarter buying decisions start right here by using the Personal Computing Free Information Card, a clearinghouse of information covering the products and services contained in this issue. From full systems, software and peripherals to professional support services.

What's more, you can use the Free Information Card to efficiently gather a comprehensive file of facts, figures and product specs to sort out competing claims, evaluate the available products on the market and make the best purchase.

Because, quite simply, making the wrong buying decision today can all too often prove costly. In Time. Money. And Influence.

Easy as 1-2-3.

1- Circle the appropriate Free Information numbers, referring to the Product Index for additional information.

2- Fill in your name and address in the space provided.

3- Mail this card today—postage is ABSOLUTELY FREE—and receive the valuable information you need, directly from the manufacturers, thanks to Personal Computing . . . where intelligent buying decisions begin. Month after month.

COMPLETE AND MAIL THIS POSTAGE PAID CARD . . . TODAY!

MARCH 1987

Use this card for FREE and FAST information about the products & services listed in this issue. Simply circle the appropriate numbers below.

1	31	61	91	121	151	181	211	241	271	301	331	361	391	421	451	481
2	32	62	92	122	152	182	212	242	272	302	332	362	392	422	452	482
3	33	63	93	123	153	183	213	243	273	303	333	363	393	423	453	483
4	34	64	94	124	154	184	214	244	274	304	334	364	394	424	454	484
5	35	65	95	125	155	185	215	245	275	305	335	365	395	425	455	485
6	36	66	96	126	156	186	216	246	276	306	336	366	396	426	456	486
7	37	67	97	127	157	187	217	247	277	307	337	367	397	427	457	487
8	38	68	98	128	158	188	218	248	278	308	338	368	398	428	458	488
9	39	69	99	129	159	189	219	249	279	309	339	369	399	429	459	489
10	40	70	100	130	160	190	220	250	280	310	340	370	400	430	460	490
11	41	71	101	131	161	191	221	251	281	311	341	371	401	431	461	491
12	42	72	102	132	162	192	222	252	282	312	342	372	402	432	462	492
13	43	73	103	133	163	193	223	253	283	313	343	373	403	433	463	493
14	44	74	104	134	164	194	224	254	284	314	344	374	404	434	464	494
15	45	75	105	135	165	195	225	255	285	315	345	375	405	435	465	495
16	46	76	106	136	166	196	226	256	286	316	346	376	406	436	466	496
17	47	77	107	137	167	197	227	257	287	317	347	377	407	437	467	497
18	48	78	108	138	168	198	228	258	288	318	348	378	408	438	468	498
19	49	79	109	139	169	199	229	259	289	319	349	379	409	439	469	499
20	50	80	110	140	170	200	230	260	290	320	350	380	410	440	470	500
21	51	81	111	141	171	201	231	261	291	321	351	381	411	441	471	501
22	52	82	112	142	172	202	232	262	292	322	352	382	412	442	472	502
23	53	83	113	143	173	203	233	263	293	323	353	383	413	443	473	503
24	54	84	114	144	174	204	234	264	294	324	354	384	414	444	474	504
25	55	85	115	145	175	205	235	265	295	325	355	385	415	445	475	505
26	56	86	116	146	176	206	236	266	296	326	356	386	416	446	476	506
27	57	87	117	147	177	207	237	267	297	327	357	387	417	447	477	507
28	58	88	118	148	178	208	238	268	298	328	358	388	418	448	478	508
29	59	89	119	149	179	209	239	269	299	329	359	389	419	449	479	509
30	60	90	120	150	180	210	240	270	300	330	360	390	420	450	480	510

USE BEFORE MAY 31, 1987

PLEASE PRINT CLEARLY—use only one card per person.

Name _____ Phone No. (____) _____

Company _____ Title _____

Address _____ Apt. _____

City _____ State _____ Zip _____

3-1

MARCH 1987

Use this card for FREE and FAST information about the products & services listed in this issue. Simply circle the appropriate numbers below.

1	31	61	91	121	151	181	211	241	271	301	331	361	391	421	451	481
2	32	62	92	122	152	182	212	242	272	302	332	362	392	422	452	482
3	33	63	93	123	153	183	213	243	273	303	333	363	393	423	453	483
4	34	64	94	124	154	184	214	244	274	304	334	364	394	424	454	484
5	35	65	95	125	155	185	215	245	275	305	335	365	395	425	455	485
6	36	66	96	126	156	186	216	246	276	306	336	366	396	426	456	486
7	37	67	97	127	157	187	217	247	277	307	337	367	397	427	457	487
8	38	68	98	128	158	188	218	248	278	308	338	368	398	428	458	488
9	39	69	99	129	159	189	219	249	279	309	339	369	399	429	459	489
10	40	70	100	130	160	190	220	250	280	310	340	370	400	430	460	490
11	41	71	101	131	161	191	221	251	281	311	341	371	401	431	461	491
12	42	72	102	132	162	192	222	252	282	312	342	372	402	432	462	492
13	43	73	103	133	163	193	223	253	283	313	343	373	403	433	463	493
14	44	74	104	134	164	194	224	254	284	314	344	374	404	434	464	494
15	45	75	105	135	165	195	225	255	285	315	345	375	405	435	465	495
16	46	76	106	136	166	196	226	256	286	316	346	376	406	436	466	496
17	47	77	107	137	167	197	227	257	287	317	347	377	407	437	467	497
18	48	78	108	138	168	198	228	258	288	318	348	378	408	438	468	498
19	49	79	109	139	169	199	229	259	289	319	349	379	409	439	469	499
20	50	80	110	140	170	200	230	260	290	320	350	380	410	440	470	500
21	51	81	111	141	171	201	231	261	291	321	351	381	411	441	471	501
22	52	82	112	142	172	202	232	262	292	322	352	382	412	442	472	502
23	53	83	113	143	173	203	233	263	293	323	353	383	413	443	473	503
24	54	84	114	144	174	204	234	264	294	324	354	384	414	444	474	504
25	55	85	115	145	175	205	235	265	295	325	355	385	415	445	475	505
26	56	86	116	146	176	206	236	266	296	326	356	386	416	446	476	506
27	57	87	117	147	177	207	237	267	297	327	357	387	417	447	477	507
28	58	88	118	148	178	208	238	268	298	328	358	388	418	448	478	508
29	59	89	119	149	179	209	239	269	299	329	359	389	419	449	479	509
30	60	90	120	150	180	210	240	270	300	330	360	390	420	450	480	510

USE BEFORE MAY 31, 1987

PLEASE PRINT CLEARLY—use only one card per person.

Name _____ Phone No. (____) _____

Company _____ Title _____

Address _____ Apt. _____

FREE INFORMATION CARD

Start Right Here.

Smarter buying decisions start right here by using the Personal Computing Free Information Card, a clearinghouse of information covering the products and services contained in this issue. From full systems, software and peripherals to professional support services.

What's more, you can use the Free Information Card to efficiently gather a comprehensive file of facts, figures and product specs to sort out competing claims, evaluate the available products on the market and make the best purchase.

Because, quite simply, making the wrong buying decision today can all too often prove costly. In Time. Money. And Influence.

FREE INFORMATION!

Easy as 1-2-3.

- 1-** Circle the appropriate Free Information numbers, referring to the Product Index for additional information.
- 2-** Fill in your name and address in the space provided.
- 3-** Mail this card today—postage is ABSOLUTELY FREE—and receive the valuable information you need, directly from the manufacturers, thanks to Personal Computing . . . where intelligent buying decisions begin. Month after month.

**COMPLETE AND MAIL THIS
POSTAGE PAID CARD . . . TODAY!**

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 130 DALTON, MA

Postage will be paid by addressee:

**PERSONAL
COMPUTING**

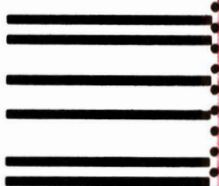
THE MAGAZINE

READER SERVICE

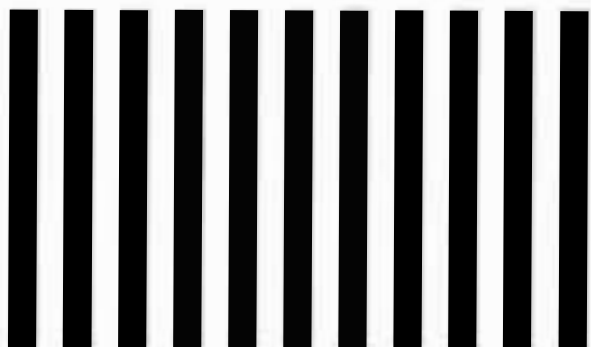
MANAGEMENT DEPARTMENT

P.O. BOX 386

DALTON, MA 01227



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES



BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 130 DALTON, MA

Postage will be paid by addressee:

**PERSONAL
COMPUTING**

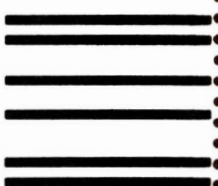
THE MAGAZINE

READER SERVICE

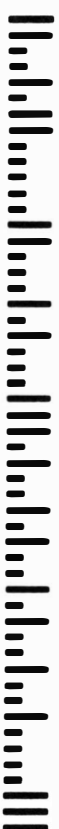
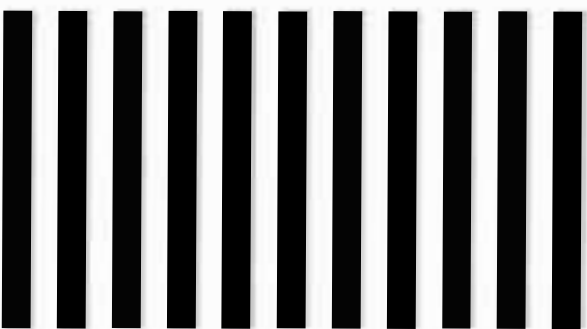
MANAGEMENT DEPARTMENT

P.O. BOX 386

DALTON, MA 01227



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES



Why Do They Look So Different But Cost About The Same?

This is Toshiba 24 pin letter quality.

This is 9 pin printer quality.

When we developed the P321 and P341e 3-In-One™ dot matrix printers, we had just two goals in mind.

Superb 24-pin letter-quality reproduction. And a price that's as close as possible to standard 9-pin models.

One look at the print sample shows you we succeeded. So will one look at the price.

In fact, we were so successful, we gave these 24-pin printers with the 9-pin price a special name: *The Affordable Class*.

And we included features—starting with type font cartridge capability—that put them in a class by themselves.

Both the Toshiba P321 and P341e printers produce letter-quality documents at 72 CPS, drafts at 216 CPS and high-resolution graphics at 180 x 360 dpi.

Each printer has our industry-standard P351 command set for more sophisticated word processing and high-resolution graphics.

And each printer has standard application compatibility with the entire IBM PC¹ line of products.

Options include downloadable disk capability and type font cartridges for an unlimited range of type styles, a one- or two-bin sheet feeder

as well as continuous forms tractor feeder.

The affordable and compact P321: If you're keeping an eye on the bottom line, we'd like to direct your attention to our P321. When it comes to virtually all business and correspondence needs, it fills the bill nicely.

You get letter-quality reproduction in a printer that looks great on the bottom line.

The affordable extended-carriage P341e: If you need to do full-size spreadsheets, you need our wide-carriage P341e.

Like the P321, the P341e uses our 24-pin printhead that lasts up to four times longer than other printheads, and has made us the number one seller in the business.

So buy a Toshiba Affordable Class P321 or P341e printer today.

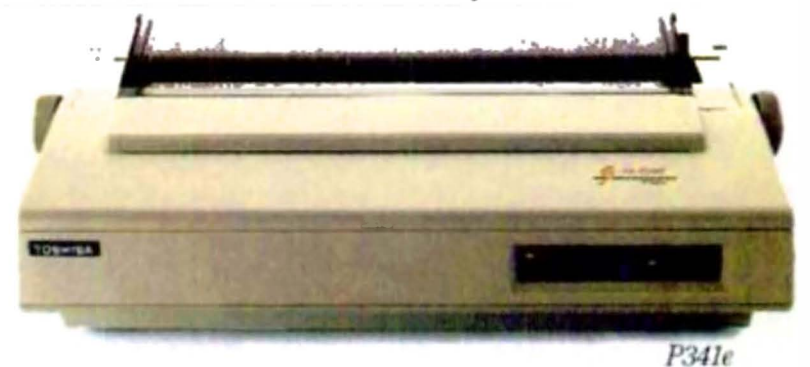
You'll get letters that look perfect every time at no extra cost.

For the Toshiba printer and computer dealer nearest you, call 1-800-457-7777.

1. IBM PC is a registered trademark of International Business Machines Corporation.



P321



P341e

In Touch with Tomorrow

TOSHIBA

Toshiba America, Inc., Information Systems Division
CIRCLE 203 ON READER SERVICE CARD

The Experts in Accessories

Manufacturing Company, Inc.

CURTIS



Universal Printer Stand Save Space, Save Money...Only \$19.95

The new PS-1 Universal Printer Stand from Curtis holds any printer, standard carriage or wide, saves valuable work-space, and costs only \$19.95. The PS-1 uses no more desk-top space than the printer itself, and provides storage for input paper underneath the printer. Plus, a removable paper tray automatically stacks output.

Besides saving space, the PS-1 holds the printer at a slight pitch, to improve line of sight, saving you neck and eye strain. Give yourself more room to work, and a system setup that's more efficient and organized: The PS-1 Universal Printer Stand from Curtis — the experts in accessories. #PS-1 Retail...\$19.95

Curtis products are available nationally from leading Dealers, Distributors, and Retail Chains.

In Canada: Micro-Computer Products, P.O. Box 235, Ajax, ONT, Canada L1S 3C3, (416) 427-6612

For the Curtis dealer nearest you call (603) 924-3823

Fits all printers, standard carriage or wide.



Conveniently stores paper underneath, improves line of sight to printout, removable paper tray catches and folds printouts automatically.



Improves line of sight for portable computers too!



Totally universal. Heavily constructed components, colored and textured to match or complement all microcomputer systems.



Manufacturing Company, Inc.

CURTIS

305 Union Street, Peterborough, NH 03458